

C. V. Riley.

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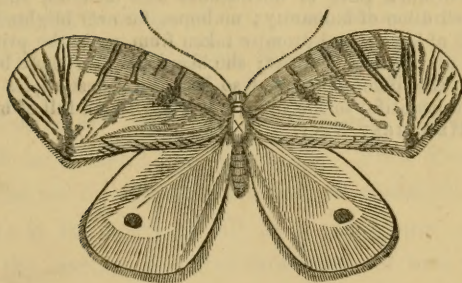
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THE
ENTOMOLOGIST.

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VOLUME III.



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Nature is the living visible garment of God.—GOËTHE.

Nature is the time-vesture of God, that reveals him to the wise and hides him from the foolish.—CARLYLE.

Nature never deceives us ; the rocks, the mountains, the streams, always speak the same language ; a shower of snow may hide the verdant woods in spring ; a thunderstorm may render the blue limpid streams foul and turbulent ; but these effects are rare and transient : in a few hours, or at most in a few days, all the sources of beauty are renovated, and Nature affords no continued train of misfortunes and miseries, such as depend upon the constitution of humanity ; no hopes for ever blighted in the bud ; no beings full of beauty and promise taken from us in the prime of youth : her fruits are all balmy and sweet : she bears none of those blighted ones, so common in the life of man, and so like the faded apples of the Dead Sea, fresh and beautiful to the sight, but when tasted full of bitterness and ashes.—SIR HUMPHREY DAVY.

PREFACE.

A THIRD VOLUME of the 'Entomologist' is completed,—a volume in no respect inferior to its predecessors, and offered at a price (seven shillings) that places it within the reach of every collector of insects. I use the term "collector" advisedly; *first*, because it is transparent and truthful; *secondly*, because I like it. We have, in days gone by, met with aspirations that we should become "entomologists," something better than "mere collectors," which means that we give up the fields and forests, the lanes and the streams; give up the net and laurel-box, and take to writing in a language that no one can read; that we print alternate words in *Italics*, and stop every third word in the middle. I am a "mere collector," and only wish I had the time at my disposal to be a more assiduous one. The 'Entomologist' is the "collector's" organ, his medium of communication with his friends: it is hailed by all as a messenger of good: it has been the source, the fountain-head, of new friendships innumerable; it is the cement which binds together old friendships with a firmness and a strength that promise perpetuity.

Until very lately the few books on Entomology which we possessed were written in a language we did not understand, and printed in a manner we could not read; in fact every

effort was made to make them repulsive by rendering them scientific. "There can be no doubt that the absence of attractive works on Entomology was the reason why Entomology itself was so generally neglected amongst us. Convinced that this was the chief obstacle to the spread of Entomology in Britain," Messrs. Kirby and Spence "resolved to do what was in their power to remove it, and to introduce to their countrymen a mine of pleasure, new, boundless and inexhaustible, and which, to judge from their own experience—formed in no contracted field of comparison—they can recommend as possessing advantages and attractions equal to those held forth by most other branches of human learning." And they succeeded: the study of insects, once deemed ridiculous, has ceased to be so, because it has become ennobled by its cultivators. Rarely indeed have two such men as William Kirby and William Spence joined hand and hand in a task of such pure and unselfish labour, and still more rarely has such labour been crowned with so decided a success. To this success alone is to be attributed the popularity of a science, which in the hands of a Marsham or a Haworth was very scientific, very precise, very philosophical, but—shall I write it—very unattractive.

When Kirby and Spence commenced their task the students of Entomology were few and far between,—one in Norfolk, another at Hull, half-a-dozen in London. Now there are collectors in every town, and the 'Entomologist' wends its way once a month into almost every hamlet in the United Kingdom.

To myself, who have always made that particular branch of the science my chief delight, it is a source of inexpressible

pleasure to find life-history so ably and philosophically studied. It was so with the fathers of the science; De Geer and Réaumur have never been excelled, but for a long time they had no disciples. Now we are all travelling the same road. Smith with the bees; Armistead with the gallflies; Stainton with the Microlepidoptera; Crewe, Machin, Hellins and Buckler with the Macrolepidoptera; and a host of others, are watching the growth and changes of our caterpillars as carefully as ever a fond mother watched the progress of her children. It is thus, and thus only, that we can attain that intimate knowledge of a species which enables us to write its real history.

In a companion Journal I am making an endeavour to classify those phenomena which are usually comprehended under the vague term "variation": that I shall succeed entirely I do not presume to hope, but I have already succeeded in calling attention to a subject previously neglected; for although a variety has always been acknowledged a variety, it has been nothing more. It has never been studied as one of a group of phenomena that required connection, classification and explanation. I introduce the subject here only to announce my object, and to say how glad I shall be of assistance.

I have also to ask the assistance of my brother entomologists in another cause. I have commenced an "Illustrated Natural History of British Moths:" with the exception of a few of the Eupitheciæ, which are either so small, so obscure, or so like cognate species, as to defy the ability of an artist to distinguish them, each moth, so far at least as the termination of the Macrolepidoptera, will be represented of the

natural size. Varieties, where they can be procured, will also be figured; thus, in the parts already published, there are five figures of *Grossulariata*, six of *Silaceata*, three of *Russata*, and so on: it is my wish to make each species recognizable in all its forms. It is by the loan of such varieties that entomologists can render the science a most important service. Mr. Doubleday, Mr. Bond and Mr. Wellman are already assisting me with the utmost cordiality, and, as I advance towards completion, others are invited to unite. In this work the life-history of each species will be given, so far as I have ascertained it: and the vast amount of information gained within the last few years will strike every reader as something wonderful. Most earnestly do I entreat that entomologists will forward me descriptions of larvæ whenever they have made them. The life-histories are arranged and tolerably complete as far as the end of the *Cuspidatæ*, but the whole of the *Noctuæ* remain to be described, and it is in writing the life-histories of these that I more particularly desire assistance: from time to time I propose to give, in the pages of the 'Entomologist,' a list of those larvæ that are most desired.

Lastly, I look forward to the publication, in March, of a little tract, as it might be called, under the title of "The Insect-Hunter's Year-book:" its object will be to give a summary of the entomological discoveries of the previous year, as regards Great Britain and Ireland; it will be arranged in the most compendious form, and published at the lowest possible price. The size of page and paper will be uniform with the 'Entomologist,' to which it will form a sort of systematic Index.

EDWARD NEWMAN.

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THE ENTOMOLOGIST.

No. 24.*]

JANUARY, MDCCCLXVI.

[PRICE 6D.

Entomological Notes and Captures.

Colias Edusa in Cornwall.—A mistake occurs in my communication (Entom. ii. 338), where it is stated that 77 captures were made on the 1st of November: it should stand thus: up to and including November 1st, 901: subsequently, during November, 71: total 972. — *Stephen Clogg; East Looe, December 16, 1865.*

Argynnis Lathonia in the Isle of Wight.—On the 4th of November two of my friends each brought me a specimen of *Argynnis*, which by their kindness are now in my collection. They were taken on the same line of cliff as those previously taken by me and already recorded (Entom. ii. 340), and are of similar size. — *Alfred Owen; Bush Cottage, Ventnor, Isle of Wight, November 24, 1865.*

Arge Galathea: var. without black markings.—A single specimen of a variety of *A. Galathea*, having the black markings absent, but supplied by others of a golden brown hue, was taken by me in the summer of 1864, and the capture subsequently made known in 'Young England' (iv. 81). Having since heard that this lovely variety has become rather common, I should like to know whether this is really the case. I should also be glad to hear if any of the Lepidoptera-collecting contributors to the 'Entomologist' have noticed it during the past season. I have several times visited the same spot where I took this variety (a rough grassy pasture, where *A. Galathea* abounded throughout the months of July and August), but have not since met with it. — *F. Wilkinson; Stamp Office, Market Harborough.*

Nemeobius Lucina bred.—I have been fortunate enough to breed this butterfly this season. Some eggs were sent to me which hatched about the 3rd of June. Its natural food,

* No. 23 is the Index Number for Vol. ii.

cowslip, being scarce around here, I was obliged to have recourse to primrose, not a very distant relative certainly. On this plant the larvæ did remarkably well, and on the 24th of July seven had changed to pupæ, the others changing in due course. At this date (Nov. 12th) they are all looking well, and will, I have little doubt, produce the perfect insect the end of next May or beginning of June.—*J. Pristo; Alverstone, Whippingham, Isle of Wight.*

Note on Acherontia Atropos, &c.—Out of seventeen pupæ of *Atropos* which my neighbour Mr. Nickisson and I have in our possession between us, one imago only has appeared up to this time, and that, although perfect in every other respect, had the wings crippled and undeveloped. Being thus unfit for a cabinet specimen, I took it over to my neighbour, the Rev. W. Houghton (whose name you probably know well), to examine with his microscope, in order to ascertain not only its sex, but whether, if a male, there was any structural imperfection corresponding to barrenness in the female, or which would in any way support the notion that all the autumn specimens are incomplete by reason of their hasty development. The following is his written report:—"The specimen, though dwarfed, is a male, and I see nothing abnormal in the structure of the genital organs. The bulb-like testes characteristic of the Lepidoptera were full of active spermatozoa." With respect to Mr. Greene's observation (*Entom.* 325) on my question, "Is not this the only species of Lepidoptera in which the female appears first?" I merely to repeat my question, with reference of course to Lepidoptera in a *state of nature*, not in the abnormal condition of captivity. I was not aware that the appearance of the female first was common even in captivity, and I still believe that in a state of nature the reverse is the rule, at any rate with the butterflies and many of the most noticeable moths. I should be glad to learn the experience of others on this point; for surely our aim should be to discover, as far as possible, in the case of *Atropos* or other species, what is the rule of appearance, in a general way, in a state of nature. By way of an example, can any of your readers inform me whether the females of *E. versicolor* appear first in captivity, as my experience certainly tells me that, at liberty, the male of that species appears first?—[*Rev.*] *Percy*

Andrews; Lilleshall Rectory, Newport, Salop, November 17, 1865.

Note on Acherontia Atropos. — Among the many parts of England in which this insect has been abundant, the neighbourhood of Winchester should be mentioned. During the four months of July to October thirty-five specimens were brought to me by boys and others occupied in the neighbouring gardens and potato-fields, some in the larva state, some in the pupa, and two perfect insects. Of the caterpillars two were of the gray variety with white heads; the rest green, being perhaps of different sexes. All were fed on potato-leaves, and underwent their first transformation in August and September. About one in six of the pupæ assumed the perfect form in October; the remainder are lively when touched, and will, I suppose, remain in their present state till next year. The moths were easily killed by placing them in a wide-mouthed French-plum bottle, separated by a layer of cotton wool from some bruised laurel-leaves. They became torpid in a short time, and at the expiration of twenty-four hours, during which they were kept in a dark place, they were quite dead.—*C. A. Johns; Winton House, Winchester.*

Acherontia Atropos and its Power of Squeaking. — Mr. Johnson states [Entom. ii. 325] that this is caused by respiration through an aperture under each superior wing, the aperture having a covering of hairs which, when the insect squeaks, assume a form like the bottom of a flageolet, and are depressed and lie even with the body when at rest. This solution, however, cannot be the right one, as is at once proved by the fact that the female squeaks as loud as the male, although she has no such trumpet-shaped apertures. I have bred a few specimens of *Atropos* this season, and from my observations of them am inclined to think the sound is caused by the forcible passage of air through the spiracles. The members by which Mr. Johnson supposes the sound is produced have been under my notice for some time back, having first observed them in *Xylophasia polyodon* a few years ago (in which species they are strongly developed), and since in various other species of *Lepidoptera*; and as I am not aware that they have been mentioned by any author I will give a rough description of them. They

are attached to the under side of the first abdominal segment by a short stalk, and when not in use are tucked in a longitudinal skinfold or pocket on each side of the abdomen beneath the inferior wings (not the superior wings, as stated in Mr. Johnson's communication), and they have, I believe, no connexion with the respiratory organs. In appearance they resemble a lady's fan when closed, and are composed of a number of very fine setæ united at their bases. The moth has the power of darting them out rapidly, and at the same time spreading them out like a hollow disk. On picking one out of its sheath with the point of a needle it emits a very perceptible odour, which varies according to the species, that of *X. polyodon* being rather like peppermint, and in *Leucania pallens* it is like the smell of bruised laurel-leaves. Probably it is for the purpose of giving out a small quantity of this odour at a time that the insect is furnished with these curious appendages, which are absent in the female of all the species I have examined. As these organs do not seem to be developed in every species of Lepidoptera, their presence or absence may possibly be worth noting in determining the relationship of species. *A. Atropos* is not the only Lepidopteron I have observed to produce sounds: I had some pupæ of *Thecla Quercus* last summer which made a noise similar to that of the imago of *A. Atropos*, but proportionately weaker. — *William H. Taylor; Burlington Street, Sunny Bank, Leeds, November 20, 1865, in the 'Field' Newspaper.*

The mode in which Acherontia Atropos makes its Noise.— Seeing a notice of the squeaking of *Atropos* (Entom. ii. 325), I think it may be as well to state a different theory about the squeaking to that given. On killing one a short time ago, the pen in which I had the oxalic acid struck against what seemed to me to be a very strong muscle, and on moving it up and down I produced a sound exactly similar to the squeak, so much so that I called the attention of those who were in the room to the fact, and all agreed with me as to the resemblance between the two sounds. I had always believed the sound to be caused by some such means as the one above mentioned, and I am greatly surprised to find a different theory broached.— [Rev.] *T. A. Preston; The College, Marlborough, November 7, 1865.*

[Mr. Preston's view of the case exactly corresponds with my own, as already expressed (Entom. ii. 284). I ought also to say that Mr. Johnson has most kindly visited me for the express purpose of explaining his theory, but has failed to convince me of its soundness.—*Edward Newman.*]

Acherontia Atropos, *Sphinx Convolvuli*, &c., in Orkney. —It may interest the readers of the 'Entomologist' to know that even here, almost at the northern extremity of our island, we have been favoured with a visit from *Acherontia Atropos*. At a village some ten miles from here the presence of the larva has filled the inhabitants with terror, its comparatively immense size raising a suspicion that, instead of being the harmless creature it is, it might possibly be a new Ophidian, and great in consequence was the persecution the poor thing had to suffer. I have a splendid specimen, the *facile princeps* of my collection, now before me, which I found reposing under the eave of my own dwelling. It was a proud moment for me when I secured him, being my first specimen, and, with mixed feelings of regret and delight, I sent him "to sleep the sleep that knows no waking." *Sphinx Convolvuli* and *Vanessa Cardui* have likewise been pretty abundant.—*Alexander Davidson; West End, Dingwall, N.B., November 11, 1865.*

Acherontia Atropos at Leominster. — On the 1st of September our gardener, while digging potatoes, turned up a noble pupa of *A. Atropos*. It was instantly brought to me, when I found it had been wounded on the left side of the head and thorax, there being a cut in the pupa-case full three-fourths of an inch long, through which some moisture kept oozing. Although fully expecting it would die of its injury, I buried it in fine earth, but it quickly came to the surface. I covered it with damp moss, and placed it in a garden-frame which was kept gently heated. On the 22nd of October a very fine imago came out, quite perfect, excepting that the left antenna was far smaller than the right, though just as well formed.—*E. S. Hutchinson; Grantsfield, Leominster, December 1, 1865.*

Sphinx Ligustri: female cripple. — A short time ago I had a female specimen of *Sphinx Ligustri* brought to me, which had been captured in the morning as soon as she had escaped from the chrysalis. She was immediately placed in

a shallow box, so that the wings could not become developed, and when brought to me she was a complete cripple. In the evening I placed her on a post in the garden, thinking perhaps the dew might have some effect on her wings. The next morning I found her still on the post, but in copulation with as fine a male as I have ever seen. — *Stephen Clogg ; East Looe, Liskeard.*

Chærocampa Celerio at Newmarket. — Yesterday I saw a fine specimen of *Chærocampa Celerio* which flew into a shop at Newmarket last month, and was given to Mr. Postans, who also showed me one of four larvæ of the same species taken from a vine at Newmarket. The larvæ varied much in colour, one being of a light brown, but the one I saw was green, having an eyelet with a silvery pupil on the 4th and 5th segments, and a pale line extending from them to the horn. — *Wm. Gaze ; Great Thurlow, November 9, 1865.*

Macroglossa Stellatarum deceived. — Although we have had enough and more than enough notes on the humming-bird hawk-moth this season, I think the following is curious enough to be recorded. A friend informed me this morning that one day in the summer he was called by a member of his family into one of his rooms, to see the curious movements of a moth which had got into the apartment. The paper of the room is light-coloured, with a pattern of scattered bunches of flowers, red with green leaves, as he was kind enough to show me ; and these flowers the moth was visiting one after the other, as it is often seen to do when flowering-plants are trained on a wall. I was doubtful whether it might not be that the moth was merely fluttering about the wall to find an exit, but my friend assured me that the insect went from flower to flower deliberately, and added that he would scarcely like to say that it did not miss a blossom there depicted, but it seemed to him to take them all in turn. This case of instinct at fault I think more remarkable than if the insect had gone to a bouquet of artificial flowers. — *George Guyon ; Ventnor, Isle of Wight, November 16, 1865.*

Note on Pæcilocampa Populi and Petasia cassinea. — Last year I sent you a note on *Pæcilocampa Populi* expanding its wings some time after release from the pupa, when broken by accident (*Entom.* ii. 133). This year I have broken

two on purpose. The result is this:—In the first case the imago, a male, remained with its wings unexpanded for half an hour. In the second case the imago, a female, was released from the pupa in the middle of the day of November 9th: the wings did not expand till the morning of the 13th: it was then as fine and perfect an insect as I ever saw. In another instance I had a pupa of *Petasia cassinea*. It was so long in emerging that I thought it had dried up. I removed the case, when it just moved, and, turning on its back, seemed to all appearance dead. In about two hours it had become a perfect male imago. Now this time is strange, for I always thought that exposure to air after a short time prevented the expansion of the wings. — [Rev.] *E. Hallett Todd*.

Economy of Orgyia gonostigma. — I wish to place upon record a few particulars in the history of this insect, by way of supplement to Mr. Newman's graphic description of the larva (Zool. 8696). I am not fully acquainted with its geographical range in this country, but it appears to be confined to a few spots, owing to the sedentary habit of the female. Indeed it is a wonder how *O. antiqua* got itself so universally distributed, though this may be partly explained by the activity of the larva, which uses its "locomotives" with great agility. *O. gonostigma* is, however, decidedly sluggish. To my knowledge it only occurs in one locality about London, this being a hollow of small extent, but thickly covered with underwood. Here this species was once found profusely, and though visitors with entomological intents are now frequent it is still tolerably plentiful. Beginning at the egg, the first circumstance noteworthy is the number that are deposited, especially as compared with those laid by its near ally, *O. antiqua*. This latter rarely lays more than 150 (I have noticed that the ovary is very often not nearly emptied), while *O. gonostigma* deposits about 500 eggs. These the female covers with the velvety pile with which her abdomen is clothed. This is remarkable, since the eggs in this country need no protection, being hatched very speedily; but on the Continent, where the insect is double-brooded, I am informed that it passes the winter in the egg state. The favourite food-plant of the larva seems to be oak, but it is also found upon the hazel

and sparingly upon birch. In spring, when other food is scarce, it nibbles at the young buds of hawthorn and willow. When the sun shines it is more readily found, feeding or basking upon the external twigs; but in damp weather it retires to the denser portions of the mixed underwood. In confinement, during the winter months, some larvæ enclose themselves in a slight web, or hide within a curled and withered leaf; others extend themselves rigidly, making no attempt at any covering. The habits of the male do not give the moth that right to its English name which *O. antiqua* certainly has. The flight of *O. gonostigma* is not a "vapouring," but a strong, sharp sweep, though of short duration, the insect coming suddenly to rest in the manner of *Bombyces*, with its fore legs extended, and then suddenly whirring off again. This can only be seen when the sun is bright, for which, like the larva, the male has a preference; on dull days it will continue entirely motionless, unmoved even by the proximity of the female. On a fine day, however, the process called "sembling" is efficacious for its capture. This season being a forward one, my brother determined to attempt an experiment made once by Mr. Machin, *viz.*, the forcing of an autumn brood of this insect, and succeeded to admiration; for while those brought through by Mr. Machin were diminutive, his were of the natural size. The eggs taken for this purpose were laid on the 18th of June, and the young brood emerged on the 6th of July. They were well supplied with oak, and kept under cover, though not in a very warm place. These passed through the usual ecdyses (six?), and began to spin up on the 20th of August, the imago appearing through September, and even up to the end of October, some larvæ growing much more rapidly than others. A small portion of the brood (about thirty) did not feed up sufficiently fast, and are now hibernating. Some females, impregnated in captivity, deposited eggs, from which young larvæ appeared the first week in October. Thinking that perhaps at this remarkable season the larvæ at large might have done the same as those in captivity, I used the beating-net in their locality about the end of September, but found only half-grown larvæ, evidently about to hibernate. — *John R. S. Clifford*; 21, *Robert Terrace, Chelsea, November 2, 1865.*

Orgyia gonostigma bred. — Through the kindness of a

friend I have been enabled to rear this pretty vapourer from the egg this summer. I received some eggs from the North of England the latter part of June : these produced larvæ on the 1st of July. They were supplied with oak and sawow, the latter appearing to be the favourite, on which they fed well and grew fast ; three, however, were always smaller than the rest, and grew very slowly : these ceased eating, and hibernated on the 4th of September. The rest spun up from the 26th of July to the 5th of August, and the perfect insects appeared from the 5th to the 15th of August. Two of each sex that emerged on this day were allowed to remain : on the morning of the 16th copulation took place, and directly on separation the females began depositing their eggs on the cocoons from which they came out. The eggs as they were laid were loosely covered with down from the female's body. This is an operation *O. antiqua* does not perform, the eggs of this species, so far as I have observed, being always laid bare. From the 1st to the 4th of September the eggs that were laid on the 16th of August began hatching, and by the next day dozens of the larvæ were to be seen on their food-plants. They fed well, and about the middle of October prepared for hibernation. They drew the leaves of the plants together with silken threads, after which they changed their skins within their winter domicile, and ceased feeding. From the above it will be seen that this insect went through its transformations in a period of about six weeks, while three of the same brood are now dormant larvæ.—*J. Pristo ; Alverstoke, Whippingham, Isle of Wight.*

Bred Varieties of Sterrha Sacraria.—Mr. M'Lachlan exhibited a female specimen of *Sterrha Sacraria* captured near Worthing on the 19th of August last, and six specimens which had been reared by the Rev. J. Hellins from eggs laid by the aforesaid female on that day. Seven eggs were deposited, but one was crushed during transmission to Mr. Hellins ; the remaining six all hatched on the 29th of August ; the larvæ were fed on *Polygonum aviculare*, spun up between the 19th and 23rd of September, and were all in pupa by the 30th. The first moth, a female, emerged on the 15th of October, two more females on the 17th, a fourth female on the 19th, a male on the 25th, and, lastly, another male on the 28th of October. A full description of the egg, larva and

pupa has been published by Mr. Hellins (Ent. Mo. Mag. ii. 134), and a coloured drawing by Mr. Buckler of several varieties of the larva was exhibited. Of the six moths thus bred not one was like its mother, or bore any great resemblance to what has hitherto been considered to be the normal *Sterrrha Sacraria*; they differed also considerably from one another. Both the males had the upper wings suffused with an exquisite rosy tint, and the under wings, instead of being pure white, were clouded with fuscous; one female had the upper wings variegated with yellow and rose-colour, and the under wings yellowish; the remaining three females had the upper wings of a delicate buff, the oblique transverse stripe being blackish, and the cilia in one instance buff, in the others rosy, whilst the under wings were yellowish white. Any of these specimens, if caught at large, might very pardonably have been described as a new species; and the amount of variation to which it now appeared that *Sterrrha Sacraria* was liable seemed to throw doubt upon the specific distinctness of the several continental forms which had been described as species allied to *S. Sacraria*. In reply to enquiries Mr. M'Lachlan stated that *Polygonum aviculare* was not previously known to be the natural food-plant, but had been given to the larvæ experimentally, and was eaten with avidity. M. Carl Plotz had figured the larva on a species of chamomile, but as the moth occurred in all parts it must either feed on some plant of very wide distribution, or more probably was polyphagous.—*Proc. Ent. Soc., Nov. 6.*

Abraxas grossulariata hibernating as a Pupa.—I have at the present time (November 20th) a pupa of *Abraxas grossulariata*; the larva I observed feeding on apricot in September, being then more than half-grown. Surprised at such an abnormal example, I took it: it continued to feed moderately, and grew slowly until the second week in November, when it assumed its present state. Have any of your readers observed any similar instances of deviation in this insect? — *George Gascoyne; Newark.*

Note on Ptilophora plumigera. — I have for several years bred *Ptilophora plumigera*, and each year have observed that the perfect insect emerged in batches, and at considerable intervals. I omitted until the present autumn to take reliable notes. This year I had a sufficient number in the

pupa state to enable me to confirm my previous impressions, and to record the following results. I may remark that the state of the weather did not appear to affect the emergence, as one batch appeared on a dull foggy day, with low thermometer and barometer; another during bright sunny weather, with the glass high. The following statement shows that in no instance did any come out singly. I have long suspected that some influence or condition is in operation with which we are unacquainted. Can any of your readers throw light on a point so interesting? The dates and numbers run thus:—

October 23rd	....	3	emerged, viz., 2 males, 1 female.
November 4th	....	6	} Equal numbers of the sexes.
" 14th	....	7	
" 15th	....	21	
" 18th	....	3	
			2 males, 1 female.

I will take this opportunity of replying to assertions, from time to time made in the various entomological journals, that it is necessary for the perfect development of the imago that pupæ of the burying larvæ be kept moist. I believe this is quite unimportant. The plumigera above referred to buried in a dry sandy soil, and after a fortnight or three weeks were removed, and laid on a perfectly dry surface, with a little moss thrown over them. In this state they were subject to a high temperature during the latter part of summer and autumn, without any moisture whatever; yet of the forty which emerged there was only one "cripple," and she, I believe, became so from getting entangled in a small web before the wings were expanded. In other respects she was quite vigorous, and found a mate as readily as did her more comely companions.—*George Gascoyne.*

Pygæra bucephala feeding on the Cork-tree.—Last winter I was very much surprised to see several branches of cork oak-trees (*Quercus Suber*), in a plantation not far from here, stripped of their leaves. Being then too late to detect the depredator, I fully made up my mind to keep an eye on the trees this summer: this I did, and in September last I saw several colonies of the larvæ of this moth feeding on the young branches of the said trees, by no means improving their appearance. This is quite a new food-plant to me for this species: perhaps some of your correspondents may have

seen it feeding on this plant before. Its favourite food-plants appear to be oak, elm and willow, on all of which it has been very plentiful here this summer. — *J. Prido; Alverstoke, Whippingham, Isle of Wight.*

Glæa erythrocephala in Kent. — I think it may be worth while to record in the 'Entomologist' the occurrence of *Glæa erythrocephala*, at sugar in this neighbourhood, on the 17th of October last: I took a hybernated specimen here in March, 1857. — *W. O. Hammond; St. Alban's Court, Wingham, Kent, November 6, 1865.*

Phlogophora empyrea near Arundel and near Shoreham. — On the 27th ultimo I took a fine specimen of *P. empyrea* (evidently fresh from the chrysalis) at rest on a hop-bine, at the edge of the valley of the Arun, near Arundel. On the 14th of October, 1859, and again on the 6th of October last year, I met with single specimens, rather worn, on ivy-blossom, within three hundred yards of the same spot. It has also been lately captured on the banks of the Adur, near Shoreham. As its chief and well-known haunt is in the valley of the Ouse, near Newhaven, thirty miles east of the Arun, it is evident that this fine insect is spread pretty generally over the Sussex marshes within a few miles of the sea. — *R. D. Drewitt; Peppering, Arundel, October 26, 1865.*

Ecophora pseudo-spretella in Pupa-boxes. — Let me warn those who have pupæ under earth in their boxes against this wretched little insect. I took up a pupa of *Pæcilocampa Populi* the other day, and found that something had made a dinner of its body. I examined the box, and found it full of a little larva which was feeding on my finest pupæ—*ocellatus*, *ziczac*, *palpina*, &c. I sent some to Mr. Greene, and he tells me that it is the same larva which he speaks of in his book on pupa-digging. Indeed his advice is good, to remove all pupæ and put them in boxes, where, from baked earth and scalded moss, there is no danger of such destructive creatures.—[*Rev.*] *E. Hallett Todd.*

Cerostoma asperella, &c., at Leominster. — I shall be obliged to you to announce in the 'Entomologist' the capture of *Cerostoma asperella* at Leominster. I believe this insect has only been taken once before in this country, and then by Mr. Dale at Glanvilles Wootton. I have taken but a single specimen, and on the same day a lady in our party

netted a specimen of *Sarrothripa Revayana*, an insect not previously taken here. During the summer we have taken several specimens of *Hypolepia sequella* on apple and sycamore.—*E. S. Hutchinson ; Grantsfield, Leominster.*

Note on Vespa norvegica.—Is Mr. Harding quite sure that the nest he found suspended from the branch of a gooseberry-bush belonged to this species? (*Entom.* ii. 319). I ask this in the entire good faith of a brother naturalist. The question naturally arises from Mr. Harding's ignorance of the economy of the five commoner species of *Vespa*, viz., *V. Crabro*, *V. vulgaris*, *V. germanica*, *V. rufa* and *V. sylvestris*; in fact I should fancy, from Mr. Harding's description, that the nest belonged to the latter species. Mr. Harding says, "In the month of April I observed a large wasp," &c. Now, the queens of *V. sylvestris* are large, but the queens of *V. norvegica* are not particularly so; and, moreover, the markings on the abdomen much resemble each other, but *V. norvegica* may always be distinguished from *V. sylvestris* by having a well-defined anchor-shaped mark on the face, whereas the latter has a pure yellow face. If the nest belonged to *Vespa sylvestris* or *V. rufa*, it had evidently fulfilled its economy for this season, and the young queens had left in search of suitable hybernacula. The nest is enlarged by adding to the circumference of the combs. To do this they gnaw away the covering next to the combs, and add an additional one to the outside of the nest. I should add that Mr. Smith entirely agrees with me as to the species.—*H. Reeks.*

Glowworms in November.—On Tuesday, the 14th of November, I saw five glowworms in full splendour: is it not late for them?—*Stephen Clogg ; December 4, 1865.*

Apion Ononidis taken.—Mr. D. Sharp records, at p. 119 of the 'Entomologist's Monthly Magazine,' that he has taken *Apion Ononidis* of Gyllenhal, but gives no date or locality.

Ceuthorhynchus suturalis of Fabricius on the Welsh Coast.—I have the pleasure of sending you a notice of a splendid *Ceuthorhynchus*, new to Britain, which I have recently determined.

CEUTHORYNCHUS SUTURALIS, Fab.

Curcul. suturalis, Fab. Ent. Syst. Eleut., vol. i. p. 20, sp. 80.

Ceuthorhynchus suturalis, Gyll. 8, 132. Schon. Syn. Ins.

Curc., Genus 577, sp. 5.

The Fabrician description is,—

“Longirostris, ovatus, fuscus; lineâ longitudinali albâ; corpus parvum, rostrum arcuatum nigrum. Thorax fuscus lineâ dorsali albâ. Elytra striata gibba; suturâ albâ. Subtus cinereus.”

It appears to live on the sallow in Germany and France, but to be rare. Amongst Walton's types in the British Museum is an identical specimen sent to him under this name by Germar. It is rather a large species; my specimen is about the size of *C. inaeffectatus*, or a large *C. sulcicollis*. It belongs to the first section, the posterior femora not being dentate, and is *at once* distinguished thoroughly from every other by the *broad line of white scales extending from the nape of the neck to the apex of the elytra*. Taken by my friend Mr. Joseph Sidebotham, of Manchester, last spring, on the Welsh coast, “crawling on the sand.” — *John A. Power*; 52, *Burton Crescent*, November 18, 1865.

New British Coleoptera.—In the ‘Entomologist's Monthly Magazine’ for December the identification of six new species of Coleoptera is announced. 1. *Bembidium 4-signatum* of Duftschmidt, taken by Mr. Bold near Newcastle-on-Tyne. 2. *Atomaria Barani* of Brisout de Barneville, described in the ‘Entomologist's Annual’ for 1865 as a variety of *A. fumata*. 3. *Trachyphlæus aristatus*, a species separated by Gyllenhal from *T. squamulatus*, of which Mr. Walton considered it a variety. 4. *Omalium Pineti* of Thomson, a specimen of which was taken by Mr. Sharp last June, under the bark of a fir-stump at Rannoch. 5. *Leptura rufa* of Brullé, a species as large as *L. scutellata*, and of which a single specimen was captured during the past summer by Mr. Thorncroft at Holme Bush, in Sussex. 6. *Atomaria impressa* of Erichson, of which a single specimen was found by Mr. Sharp at the bottom of a hayrick near Lee.

Death of Peter Bouchard.—At the November Meeting of the Entomological Society, Mr. S. Stevens announced the death of Mr. P. Bouchard at Santa Marta, whither he had gone to collect.

THE ENTOMOLOGIST.

No. 25.]

FEBRUARY, MDCCCLXVI.

[PRICE 6D.

Description of the Larva of Lycæna Alexis (Common Blue). — The eggs are laid on *Ononis spinosa* (rest-harrow), and the young larvæ, when they emerge, feed on the leaves of this plant, on which they may be found resting much after the manner of a Chiton, a shell which in form they somewhat resemble. Head very small, glabrous, oblong, porrected in crawling, otherwise withdrawn into the 2nd segment and totally concealed: body convex above, flattened below, rounded at both extremities, dilated and lobed at the sides: the divisions of the segments conspicuously marked: spiracles situated much above the lateral margin, the posterior pair dorsal: whole surface covered with extremely minute warts, each of which emits a hair. Colour of the head intensely black, of the body green, sometimes bright apple-green, at other times dull olive-green; a medio-dorsal stripe rather darker; a narrow lateral stripe below the spiracles, but above the lateral lobes, much paler, almost white; between the dorsal and lateral stripes there are, on each side of each segment, three pale oblique lines, their inclination being from the anterior to the posterior margin of the segment; the minute warts black; legs, claspers and ventral surface of the same green hue as the body. Towards the end of July they undergo pupation: the pupa is rounded at both extremities, and is without angles; the anal extremity is without the usual minute hooks for attachment; the region about the head is furnished with minute bristles: the colour is dull green; the head, extremity of wing-cases, and ventral surface of abdomen tinged with brown. The butterfly appeared on the 12th of August. I am indebted to Mr. Doubleday for the larvæ of this insect.—*Edward Newman.*

Description of the Larva of Lobophora viretata. — Feeds on *Ligustrum vulgare* (privet), and is full-fed at the end of June, when it rests in a somewhat arched posture, the anterior part of the body being held quite free of the food-plant,

and bent outwards and upwards from the 4th segment, the head being slightly porrected: when touched or otherwise annoyed the head is tucked in a little, but the larva will not readily fall from its food-plant, or relinquish the hold by its claspers: if compelled to relinquish this hold it drops, hanging by a thread. Head not notched on the crown, decidedly narrower than the 2nd segment, into which it is occasionally partially withdrawn: body almost uniformly cylindrical, but narrowest towards the anterior extremity; 2nd segment narrower than the 3rd; 3rd narrower than the 4th; skin folded transversely, but not conspicuously so; there are no humps or conspicuous warts on any part of the body, but the 13th segment terminates beneath the anal flap in two very short, approximate, obtusely conical points, directed backwards; each of these points emits a slender bristle, and there are several other small and inconspicuous bristles on various parts of the body. Colour of the head purplish brown: body beautifully variegated with purple-brown and apple-green; the brown is mostly dorsal, the green mostly ventral, but not entirely so; on the 2nd and 3rd segments the brown is confined to an amorphous dorsal blotch; on the 4th segment it descends to the insertion of the legs; on the 5th and 6th segments it descends to the ventral surface, forming a complete band round the body; this band is, however, interrupted on the back by two transversely placed lunulate green marks; on the 9th segment it appears on the dorsal surface only; on the 10th it is confined to three parallel stripes on the dorsal, and a large patch on the ventral, surface; on the 11th there is a medio-dorsal purple stripe, and a lateral amorphous purple patch; on the 12th and 13th the purple predominates almost exclusively: legs purple-brown; ventral claspers green and very small; anal claspers almost entirely purple. It is scarcely to be supposed that this distribution of colour obtains in every individual, but it was very constant in those I have had the opportunity of examining. On the 1st of July these larvæ connected the leaves of the privet together by silken threads, and underwent pupation in the domicile thus formed. I am indebted to Mr. Doubleday for the opportunity of describing this larva.—*E. Newman.*

Description of the Larva of Tephrosia cervinaria.—Rests by day in a straight position on the under side of the leaves,

or on the leaf-stalk, of *Malva sylvestris* (common mallow), on which plant it feeds: when annoyed it tucks in the head, forming the anterior part of the body into an Ionic volute, which becomes tighter as the annoyance continues, until at last the claspers lose their attachment, and the larva falls to the ground, a compact but not uniform ring, which closely resembles the curious seed of the mallow, so familiar to all of us, when children, under the name of "cheeses:" when stretched out at length and rigidly straight it has an equal resemblance to the leaf-stalks of the same plant. Head rather narrower than the 2nd segment, scarcely notched on the crown, and semiporrect: body cylindrical, slightly scabrous, the scabrosity caused by the presence of minute warts, some of which are somewhat larger than the rest, and emit a bristle from the summit; on each segment there are usually six of these bristle-bearing warts, four of them arranged in a dorsal quadrangle. Colour of both head and body opaque apple-green, the latter with a medio-dorsal narrow and indistinct stripe of a smoky green hue, evidently due to the presence of food in the alimentary canal; the warts are white: the ventral is concolorous with the dorsal surface, and the claspers are of the same hue, but the legs are almost colourless, very nearly transparent. The larvæ, kindly given me by Col. Stewart, were full-fed on the 6th of June, and on that day retired below the surface of the earth to undergo pupation.—*Edward Newman*.

Description of the Larva of Notodonta trepida. — Sometimes rests with the head and anterior segments thrown back on those which succeed; this posture is not invariable, and seems assumed from irritation and annoyance rather than for rest. Head as wide as the 2nd segment, the crown elevated, scarcely notched; body smooth, almost uniformly cylindrical, without humps. Colour of the head apple-green, with four pale stripes down the face, the median pair somewhat approximate towards the crown, more widely separated towards the mouth; mouth and a conspicuous mark on the lower portion of the cheeks brown: body apple-green, the dorsal surface slightly glaucous; two narrow approximate yellowish white stripes down the back, extending the entire length, but interrupted at the anterior extremity; exterior to this double stripe, on each side, is an irregular and very

indistinct series of dots of the same colour; the 2nd segment has a lateral blotch of brownish yellow below the spiracle; the 3rd segment has a larger and more elongated blotch, ascending at its posterior extremity towards the back: these two blotches and the mark on the cheek form a single oblique patch when the larva is at rest; the 4th segment has a small lateral spot of the same colour, and on each side beyond this are seven oblique stripes on each side of the larva, the seventh being longer than the rest and terminating in the anal flap; these oblique stripes are longitudinally divided, the upper portion being pink, the lower white or whitish yellow; near the inferior extremity of each stripe, and almost touching it, is a pale spiracle in a black ring; in the seventh stripe the spiracle is nearly in the middle: legs pinkish; claspers unicolorous, with the ventral surface tinged with purple at the extremities. I am indebted to Mr. Hockett and Mr. Campbell for a supply of this beautiful larva. — *Edward Newman.*

Description of the Larva of Aplecta advena. — Feeds by night, on lettuce, *Polygonum aviculare* (knot-grass), and many other plants, but buries itself during the day just below the surface of the earth; when annoyed it rolls itself in a ring, generally lying on its side, the legs and claspers being visible; it is full-fed on the 1st of September, and is then very obese. Head porrected in crawling, glabrous, narrower than the 2nd segment, into which it is partially withdrawn at the will of the insect; 2nd segment narrower than the others, and having on its back a semicircular glabrous plate, the convex margin of which is directed backwards: body almost uniformly cylindrical; 13th segment very small; anal claspers very approximate and inconspicuous. Colour of the head pale semitransparent brown: dorsal surface of the body very pale brown, tinged with smoky brown; a narrow medio-dorsal stripe darker brown, tinged with olive-brown, and on each side of this a broader testaceous stripe; spiracles bright sienna-brown, margined with black; ventral surface, legs and claspers very pale semitransparent olive-brown; all the colours and every part of the body have smoke-coloured reticulations variously arranged; some of these assume the form of four dorsal dots on each segment, but all the colours and markings are confused and obscure. I am indebted to

Mr. Doubleday for a supply of this larva. — *Edward Newman.*

Description of the Larva of Rusina tenebrosa. — Feeds on *Polygonum aviculare* (knot-grass), and appears to be full-fed at the end of September. Head narrower than the 2nd segment, and susceptible of being partially withdrawn thereinto, very glabrous, with a few scattered bristles: body nearly cylindrical, very gradually attenuated towards the anterior extremity, very gradually incrassated to the anterior margin of the 12th segment, thence suddenly sloping to the anal extremity; it has a manifest lateral skinfold and a velvety surface. Colour of the head dark brown; the antennal papillæ pale at the base: body rich umber-brown, with a very narrow pale medio-dorsal stripe on the 2nd, 3rd and 4th segments, also a series of pale subdorsal markings on each side, and each of these is bounded below by a darker oblique mark; lateral skinfold paler; ventral surface, legs and claspers reddish brown. I am indebted to Mr. Doubleday for a supply of this larva. — *Id.*

Life-history of Cucullia Chamomillæ. — The egg is laid at the end of April or beginning of May, on the stems of *Anthemis Cotula* (wild chamomile or stinking feverfew): the young larva emerges at the end of May or during the first week in June: when first hatched the larva is light green, and is generally to be found coiled round the unexpanded flower-bud; it grows with great rapidity, and scarcely three weeks elapse from its being found in this diminutive state to its acquiring its full size, which is generally at the end of June, although stragglers may be occasionally found as late as the third week in July; from the 12th to the 20th of June may, however, be regarded as the best season for collecting them: they are extremely partial to waste places, such as shipwrights' yards and amongst old timber; they are very local, often occurring abundantly in one spot, and being entirely absent from another apparently similar. They do not hide during the day, as is so frequently the case with the larvæ of Noctuæ, but bask in the sunshine, and continue feeding, more especially on the flowers of their food-plant, amongst which they make great havoc. When full-fed the head is rather narrower than the 2nd segment; the body uniformly cylindrical and somewhat shining; the 12th segment

with its dorsal surface prominent, yet scarcely elevated above the plane of the back. Colour, both of head and body, either pale olive-green or pale pinkish brown; in either case the body is adorned with six nearly equidistant waved stripes of the same colour, but of a darker shade: these waved stripes are invariably bordered throughout by a delicate waved marginal line of a still darker hue, and are also intersected on each segment by a transverse interrupted band, in which reddish pink is the predominant colour: the ventral surface, legs and claspers are less variegated, having a dull homogeneous tint of obscure pink and green. When full-fed the larva buries itself very deep in the earth or rubbish, and forms a very tough cocoon, in which particles of earth or sand, or even fragments of leaves or little sticks, are intermixed and interwoven: sometimes, when a considerable number of these larvæ have been confined together, they will bury themselves in company, and their cocoons will be connected together, adhering after the fashion of a bunch of grapes. The moth usually appears about the beginning of April, but this is not invariably the case, for specimens are sometimes found breeding in March, February, and even January, and on one occasion a precocious moth ventured out in October. I am indebted to that excellent observer, Mr. Dell, of Morice Town, for these particulars, and to Mr. Buckler for the use of exquisite drawings made from larvæ furnished by Mr. Dell.—*Edward Newman.*

Description of the Larva of Heliothis marginata.—Feeds on *Ononis arvensis* (rest-harrow), and is full-fed towards the end of August, when it rests with the anterior segments slightly elevated and arched, and the head tucked in, the attitude being somewhat Sphinx-like; when annoyed it falls off its food-plant, rolling itself in a ring and feigning death; in confinement, like so many other larvæ, it feeds greedily on *Polygonum aviculare* (knot-grass). Head porrected in crawling, narrower than the 2nd segment, into which it is partially received: body almost uniformly cylindrical, but having the 12th and 13th segments rather attenuated and depressed; skin densely covered with a velvety pile of very short bristles, intermixed with longer hairs. Colour of the head pale apple-green, glabrous: body dull apple-green, the dorsal darker than the ventral surface, and irrorated with white spots, some

of which form four longitudinal series; also having numerous black dots, each of which culminates in an acute point; these black dots are particularly crowded along each lateral margin of the dorsal surface: dorsal surface bounded by a narrow white lateral stripe, extending from the head to the anal claspers; on the upper margin of this are seated the spiracles, which are nearly circular and testaceous-brown, surrounded by a black ring: the inferior margin of the white lateral stripe is shaded off into green; ventral surface spotted with white. I am indebted to Mr. Vaughan for the opportunity of describing this larva.—*Edward Newman.*

Entomological Notes and Captures.

Prior Appearance of Male or Female, &c. — Perhaps I mistake Mr. Andrews' meaning (Entom. iii. 2) when I say that he seems to think that the evidence afforded on this question by insects in *captivity* is of little or no value. If, however, this be his meaning, I would ask what reliable evidence *can* be afforded by insects in a state of nature? For, first, it is an admitted fact that, among all Orders of moths, the female, as compared with the male, is rarely met with on the wing, or indeed any other way. That very many more males are taken than females is therefore no proof that the former are earlier in their appearance than the latter. But, secondly, admitting for the moment that males and females were taken in equal numbers, I mean of course in a state of nature, how can it be shown that the former *emerge* first? Let us suppose the most favourable case possible, *e. g.*, on July 14th you begin to sugar. Some common moth, say *Polyodon*, swarms at it; but all are males. This continues for a week, at the close of which females begin to make their appearance. You may, if you please, *infer* from this that the females emerge later, but there is no *proof*, nor *can* there be, unless we had been present at the time and place when and where they assumed the perfect state. Other causes, besides the well-known one of their being much more sluggish than the males, might at least be *suggested* why, during that week, the females (if emerged) did not come to the sugar; but that one is quite sufficient for my purpose.

The great, I might almost say the only, object of the female is to procreate the species, and, as is quite correct, she requires to be *sought*, as can be abundantly proved. The female moth is of a coy and retiring nature, and, unfortunately for us collectors, too often shuns publicity. We cannot therefore, I think, fairly argue anything from their non-appearance. This leads me to the instance proposed by Mr. Andrews himself, *Endromis versicolor*. "Can any of your readers inform me whether the females of *E. versicolor* appear first in captivity, as my experience certainly tells me that, at liberty, the male of that species appears first." With regard to this question, I have not had sufficient experience in breeding that species to answer it satisfactorily. In the list given by me (*Entom.* ii. 325) I mention this insect. I had only four pupæ. From these emerged two males and two females; the former on March 19th; the latter, March 22nd. So far therefore as this isolated instance is of value, the male would emerge first in captivity. But will Mr. A. oblige me by stating how he *proves* that, at liberty, the male appears first? Is it because he *sees* it first? I am sorry to say I have never had the pleasure of seeing the "glory" on the wing, but I have read the accounts of many who have. Their testimony is to this effect, — that they have not unfrequently seen the males in numbers flying wildly and rapidly, hither and thither, in search of the females. I do not recollect a single instance in which it was said that they saw the female flying. From this non-appearance of the female on the wing, surely we cannot infer, much less ought we to assert, that it is not in existence. Take the analogous case of *Lasiocampa Rubi*. Doubtless Mr. A. has frequently seen the male of this species careering over the fields in the hot sunshine for two or three weeks together. I think I may venture to assert that during that period he has never seen a female, I mean of course flying. Does he therefore conclude that during that time there have been no females? Why, if this argument were pressed, we should have no females at all! One more question. Will Mr. A. tell me *how*, in a state of nature, I am to decide which appears first? Until it be shown how this can be done satisfactorily, I must venture to think that the results (for or against my theory), while in captivity, are fair *prima facie* evidence. Thus, if

I have twenty pupæ of fifty species, and I find that in thirty-five instances a female or females emerge first, I think it is *at least* a legitimate inference that, though in captivity, a similar result would follow in a state of nature, unless the contrary can be *proved*. Of course, as I have hinted, the argument cuts both ways: if there were a majority of *males*, &c. We have as yet, unfortunately, very few statistics to build upon. Mr. Birchall gives the results of five broods. In *four* the female emerged first. In my own case, out of fourteen the females appeared first in *ten* instances. I shall feel really glad if, during the coming season, your readers will carefully examine this question, and communicate the results through the 'Entomologist.' If nothing else, it will be an amusement, and that is something. Before I conclude I may refer to *Sterrhæa Sacaria* (Entom. iii. 9). In this instance there were six pupæ, which produced four females and two males. *All* the females emerged *first*. This example is the more interesting to me, and the more corroborative of my opinion, as I have reason to know that my friend Mr. Hellins breeds his insects out-of-doors. Mr. Gascoyne gives (Entom. iii. 10) the dates of the appearance, in the perfect state, of a quantity of *Ptilophora plumigera*. In this instance, however, males and females seem to have emerged simultaneously. — (Rev.) J. Greene; *Cubley Rectory, Uttoxeter, Staffordshire*.

Wholesale Slaughter of Colias Edusa. — May I protest against the wholesale slaughter of this beautiful butterfly, recorded in No. 23 (Entom. ii. 338)? We are there told that 935 specimens were taken within a certain time. Mr. Clogg, who communicates the fact, seems to think that it "may be of interest to your readers"! Nay, so confident is he of this, that in No. 24 (Entom. iii. 1) he takes pains to assure us that he had unfortunately *understated* the number, which should have been 972, not 935! I trust I do but express the fellow-feeling of the vast majority of your readers when I say that such "facts" only excite my disgust. I take it that this "interesting fact" may be regarded as an *advertisement*, and should therefore be charged as such. I hope, for my part, that the pages of the 'Entomologist' will, in future, be closed against such announcements.—*Id.*

[I entirely agree with Mr. Greene in condemning the

destruction of this beautiful insect in such unnecessary numbers; but I cannot at all regard Mr. Clogg's communication in the light of an advertisement: Mr. Clogg expresses no approbation, but merely states that a collector, employed by a dealer in London, has done so-and-so: he is no *particeps criminis*: the evil, I fear, is one that cannot be cured; it is owing to the avidity with which such beautiful butterflies are purchased in London: demand creates supply wherever practicable.—*Edward Newman.*]

Entomological Notes from Deal.—The year 1865 will long be remembered as one of the best butterfly years we have had for some time; but it has not been the year for *Colias Edusa*. In a field near here a few specimens of *Colias Hyale* were taken, but the only specimen of *C. Edusa* I have seen was on the 22nd of October: it appeared from its freshness to be just out. Of *Pyrameis Cardui* there have been a few. All other butterflies have been abundant. *Vanessa Urticæ* has produced brood after brood: I find that the early brood, after flying a few days, lays up for the winter; three of them laid up in a dark part of my staircase; all the hot and fine weather of September never roused them from their trance; but the later brood was flying about most merrily. In a marsh near Sandwich I found a lot of *Melitæa Artemis*, a few of *Macroglossa Bombyliiformis*, and lots of the pretty green *Ino Statices*, a sight that would have gladdened the heart of any young Entomologist. I took at the same spot *Hyria auroraria*: I think this new to Deal: I never took it before anywhere but in Hampshire. I have again taken a specimen of *Ennomos Alniaria* (female), at a lamp, but I am sorry to say a bad one. Sugar has been a dead letter here. During the fine and hot weather the nights were always foggy. *Acherontia Atropos* has been rather common.—*H. J. Harding; Park Cottage, Upper Deal, Kent.*

Remarks on various Insects.—It was in May, 1853 and 1854, that I took *Chalybe Pyraustella*, *Röslerstammia pronubella* and *Pyrochroa pectinicornis*, in Sutherlandshire; and as these insects are still unique as British, it may interest some of your readers to know the exact spot where they occurred, especially as now there is a railway within a very short distance of the place. They were all found within a short distance of one another, in a birch-wood on the banks

of the River Shen. The exact spot is between two well-known salmon-casts in that river, *viz.*, the Upper and Lower Claragh. I do not know if the spelling is correct, but any of the fishermen on the river will point to the spot at once. *C. Pyraustella* was, I think, beaten from blackthorn, *R. pronubella* from beech, and *P. pectinicornis* was taken flying in the sunshine, miles away from fir-trees, which are, I think, its usual habitat. *Scopula decrepitalis* is found, at the same time of year, in great numbers, near the same place. In July, *Aplecta occulta*, *A. tineta*, and *Acronycta leporina* occur commonly; and *Noctua conflua*, lately admitted to be a species, may be found in all kinds of varieties. We all know that a saint cannot be canonized under a certain time, and it might be curious to inquire how long a time it takes for a species to be admitted into the calendar, and what are the ceremonies observed. *Bombyx Callunæ* and *Noctua conflua* having been admitted, I do not despair of seeing *Chortobius Davus* and *C. Typhon* admitted separately. I think every one who has seen the last-named insects on the wing will agree that there is a considerable difference between them, especially as *C. Davus*, as far as I have observed, is abundant wherever it does occur, whilst *C. Typhon* is a scarce insect on the moors both in Scotland and Ireland, and you do not meet with above one or two in a day's walk. Other Entomologists may have found it otherwise; weather has so much to do with the appearance of insects. I was one day this last summer, about the middle of June, on one of the hills near Ben Nevis. The weather had been dry and bright for a long time. I had never seen *Erebia Cassiope* (now called, I see, *Epiphron*) on the wing, but from the middle to the top of the hill it was in the greatest profusion. I have no doubt that, had I been properly prepared, I could easily have taken over a thousand, and apparently almost all of them just out of the chrysalis. As it was I managed to secure twenty-seven, though I had only three pill-boxes and no net. I had always fancied that *E. Cassiope* was scarce as well as local, but it certainly was not so on this occasion. *Psodos trepidaria* and *Crambus radiellus* were also very abundant on the top of the mountain. Probably the very fine weather brought out all these insects at once, and I happened to be there the right day to see them. I am very glad

to see that *Argynnis Lathonia* has turned up in several places, and especially in those spots where its former appearance was so unnecessarily discredited. If *Polyommatus Hippothoë* does not turn up very soon, it will be considered foreign, and share the fate of *Melitæa Dia*. Poor Weaver, one of the best field Entomologists and a very accurate observer, always thought he was hardly used respecting *M. Dia*, and a good many Entomologists agreed with him. He was a most persevering collector, and the first to bring to notice many of the scarcer insects, and his word was never doubted except about *M. Dia*; but in that case the authorities had pronounced that *M. Dia* had not occurred, or ought not to have occurred, in England, and Weaver's evidence was ignored. When I first brought *Chilo obtusellus*, *cicatricellus*, *paludellus*, or whatever its name now is, from the Norfolk fens, and showed it to a distinguished Entomologist, he at once stated that it must be North American; not that he knew the insect, but it was there, and, as it was impossible that a *Tinea* (for it was so classed then) could presume to be British without his knowing it, it was assigned to the first country that happened to occur to him.—*E. C. Buxton; Daresbury Hall, Warrington, January 13, 1866.*

[A few notes on Mr. Buxton's paper may possibly possess some interest. 1. *Pyrochroa pectinicornis* is now in most of our collections, and, although unique when discovered by Mr. Buxton, has long ceased to be so. 2. The larva of *Chortobius Davus* is known; it has been fully described, and has been figured by Mr. Buckler. Some of the Scotch Entomologists ought to find the larvæ of *C. Typhon*, *Haw.*, and send them to this gentleman: this is the only way in which the disputed point, as to their being species or varieties, can be satisfactorily settled. The specimens of *C. Davus* taken in the south of Cumberland have the ocelli on the under surface of the posterior wings much smaller than those taken near Manchester: this form does not appear to be found in Scotland. In Orkney and Shetland the female specimens of *Typhon* are very pale, almost white; and the *Isis* of *Zetterstedt*, found in Lapland, is the extreme northern form, not being much larger than *Pamphilus*, very pale in colour, and generally, if not always, without any ocelli on either surface of the wings. 3. An *Erebia* was figured by Knoch in 1783,

under the name of *Epiphron*, with a white spot in the centre of the ocelli. In 1793 Fabricius described our British form, under the name of *Cassiope*, in which the ocelli are without the white spot. These two forms, supposed by many Entomologists for a long time to be distinct species, are now generally considered to be mere varieties, the white spot in the ocellus being the only difference between them; and Knoch's name, being the older of the two, is retained. 4. The case in which *Argynnis Dia* was found passed out of Weaver's hands without his knowing that this species was in it; and it might possibly have been placed there by another person, as he never positively asserted that he knew where it came from, but thought he must have taken it in a wood near Birmingham. — These notes are intended as explanatory of the views now entertained on the subjects Mr. Buxton mentions.—*Edward Newman.*]

Changes of Name, &c.—*Tapinostola Bondii* appears to be identical with *Noctua extrema* of Hubner: three years ago Dr. Staudinger expressed a belief that this was the case, and Mr. Doubleday, on a recent examination of Hubner's figure, believes Dr. Staudinger is right. Our *Nonagria neurica* agrees with *N. Arundineti* of Schmidt, and is not the *Neurica* of Hubner's figure 381. In my differentiation of *Bombyx Callunæ* and *B. Quercus* (Entom. ii. 140) I omitted a character which Mr. Doubleday has long observed; the so-called *B. Callunæ* has a conspicuous white spot in the centre of the fore wings on the under side; this spot is wanting in the so-called *Quercus*: but as the *Callunæ* of Palmer is certainly the *Quercus* of Linneus, it is desirable to revert to the Linnean name; and the *Quercus* of Stephens and of our cabinets, being thus left without a name, will require one; I think *familiaris* would be appropriate, seeing it occurs so universally about our homesteads, both here and on the Continent; while its congener frequents heaths and wilds. *Noctua conflua*, a series of which, kindly presented by Mr. Backhouse, has long stood under that name in the cabinet under my care, is found to have a very different larva from *N. festiva*: a translated description thereof will shortly appear in the 'Entomologist.'—*Edward Newman.*

Hepialus Humuli var. *thulensis*: *Barren Females of Acherontia Atropos.* — *Hepialus Humuli* was very abundant

near the little lakes of Rotterdam. M. P. Snellen found near those waters a very interesting male specimen with female coloration on the upper side. * * * As to the empty body of the female *Atropos*, it is a fact discovered by Verloun ten years ago, and published by him, but in Dutch. He observed that the abdomen was only empty in those specimens which came forth in the autumn, but that those which came out in the spring had swollen ovaries. — *J. O. Westwood's translation of a letter from M. Snellen von Vollenhoven, in 'Gardener's Chronicle.'*

Wasps plentiful near London. — So many correspondents have recorded the scarcity of wasps this season in different parts of the country, that it may be interesting to know that great numbers have been observed at Brixton and Streatham. I have chiefly noticed them late in the year, on ivy-blossom. The last week in October, when beating ivy-blossoms, I could hardly distinguish any other insects, from the great number of wasps that I had knocked into my umbrella. From Roupell Park to Brixton Church there is a great quantity of ivy, and on my way to the railway station early every morning I might have taken numbers off the walls, beneath the ivy, up to the middle of November. — *H. W. Neate ; 7, Park Terrace, Cornwall Road, Brixton Rise, December 12, 1865.*

Scarcity of Wasps. — Early in the spring I was much surprised by the number of female wasps that were flying about. On a south wall, among some trained pear, nectarine and apricot trees, I saw as many as seven at one time. From the number of females seen we naturally supposed that the number of wasps in 1865 would be as great as in 1864, when they swarmed ; but, contrary to expectation, I have never seen them so scarce in this neighbourhood. Last year, in our village alone, they destroyed and rendered marketless bushels of plums and apples. — *John Ranson ; York.*

Curious instance of Parasitism. — I have noticed something I thought might be interesting to you, as I have read something similar to it in the 'Entomologist.' I observed two parasitical larvæ make their exit through a small hole in the wing-case of two pupæ of *Acherontia Atropos*, and so thought the pupæ were killed, but on looking again about four hours after I found two perfect male moths out. In the edge of the superior wing on each side were two small holes,

about the size of a quill; otherwise the insects were perfect. I also reared, on the 25th of August, a fine male *Deilephila Euphorbiæ*, from a pupa the larva of which I obtained in Germany.—*A. von Glehn; Sydenham, November 26, 1865.*

The Locust of the Newspaper Press.—I have been very anxious to verify the reports in London and provincial papers of the appearance of the locust in Britain, with a view to a paper on the migrations of this insect. In four instances I have positively made out the newspaper locust to be *Acherontia Atropos*, three of them larvæ and one imago: in two instances they have proved to be *Macroglossa Stellatarum*, and in all other instances I have gained no result whatever, the writers being so confident of their entomological omniscience as to resent the idea of verification being needful.—*Edward Newman.*

Weevil in Granaries.—My granary has for several years been more or less infested with weevil, and during the late fine autumn it has increased to an injurious extent, committing great havoc in the barley. Can you suggest a remedy?—*Joseph Simpson; Ipswich, November 4, 1865.*

[The weevil that infests barley I suppose to be *Calandra granaria*; but correspondents should send specimens, and describe more exactly the nature of the havoc committed. I recommend Mr. Simpson to malt his barley as soon as weevils make their appearance, and then thoroughly sweep the floors and walls with a hair broom, burning the dust. By all means avoid the powders advertised for destroying insects, which are often poisonous, always useless.—*E. Newman.*]

Local Insects at Taunton.—On April 22nd I captured a specimen of *Scotosia certata* at a gas-lamp. Amongst the other insects I have taken have been the following:—*Trichiura Cratægi*: three specimens at light. *Angerona prunaria* is exceedingly abundant in the woods on the south side of the town. *Selenia illustraria* and *Ennomos angularia*: at lamps. *Anticlea sinuata*: in June, 1864, I took a specimen at Orchard Wood, about four miles from Taunton. *Petasia cassinea* comes in swarms to the gas-lamps: I might have taken hundreds; but although so plentiful it is not to be obtained until the second week in November, and seldom flies till 10 P.M. *Agrotis præcox*: in August, 1864, I bred four specimens. *Cirrœdia xerampelina*: on September 9th

I took a specimen at light, and again on the 11th, both in very good condition. *Dasypolia Templi*: on November 11th I took a magnificent female at a lamp. At the same time *P. cassinea* was swarming, and *P. Populi* and *Hybernia aurantiaria* being also common, I had as much sport as if it was in the month of June. *Toxocampa pastinum*: flying on Pickridge Heath by night: Mr. Stainton says "it flies in the midday sunshine," but I never found it to be the case. *Camptogramma fluvialata* and *C. gemmaria* [male and female]: rather common at light in September. — *Alfred J. Spiller; James Street, Taunton.*

Duplicates and Desiderata.

I can spare any of the following insects:—*G. Rhamni*, *P. Corydon*, *N. Lucina*, *V. Atalanta*, *L. Mesomella*, *E. Plantaginis*, *E. Lanestris*, *H. Velleda*, *D. Cæruleocephala*, *M. Strigilis*, *Fasciuncula*, *Arcuosa*, *A. Porphyrea*, *T. Gothica*, *Stabilis*, *A. Litura*, *C. Vaccinii*, *Spadicea*, *M. Oxyacanthæ*, *F. Atomaria*, *Piniaria*. I shall be glad of any of the following:—*V. Polychloros*, *H. Comma*, *T. Cynipiforme*, *Tipuliforme*, *Z. Trifolii*, *P. Statices*, *Globulariæ*, *L. Complana*, *Complanula*, *Miniata*, *S. Irrorella*, *A. Villica*, *O. Pudibunda*, *Antiqua*, *C. Neustria*, *P. Cassinea*, *C. Reclusa*, *A. Aceris*, *Ligustri*, *L. Conigera*, *T. Janthina*, *Rubricosa*, *Munda*, *O. Macilentia*, &c.—*J. J. Armistead; Virginia House, Leeds.*

Rev. E. Horton, Powick, Worcester, has the following insects for exchange:—*C-Album*, *Sinapis*, *Geryon*, *Mesomella*, *Unguicula*, *Multistrigaria*, *Satyrata*, *Pumilata*, *Impluviata*, *Corylata*, *Diluta*, *Flavicornis*, *Megacephala*, *Unanimis*, *Munda*, *Upsilon*, *Aurago*, *Viminalis*, *Rhizolitha*, *Ferrugalis*, *Palumbella*, *Scabrana*, *Arcuana*, *Rugosana*, *Nisana*, *Pariana*. None but good specimens sent or received.

Eggs or Larvæ.—I shall be much obliged to any one who, in the coming season, will send me a few eggs or larvæ of *E. Lanestris*, *C. Neustria*, *S. Pavonia-minor*, or *E. Russula*. I have a few eggs of *P. Populi* to give away.—(*Rev.*) *E. Hallett Todd; Windrush, Burford.*

W. DOWNING, 'Bull Inn,' Hoddesdon, Herts, has some specimens of *T. Betulæ*, *P. Adonis*, *Corydon*, *P. Statices*, *L. Helveola*, *S. Irrorella*, *E. Russula*, *L. Monacha*, *O. Gonostigma*, *Z. Æsculi*, *N. Dictæa*, *H. Contigua*, *E. Illustraria*, *E. Albulata*, *D. Rusticaria*, *P. Hippocastanaria*, and many others, for sale very cheap.

THE ENTOMOLOGIST.

No. 26.]

MARCH, MDCCCLXVI.

[PRICE 6D.

Observations on the Genus Anaspis, Geoff.

By G. R. CROTCH, Esq.

FEW persons can have long commenced the study of Coleoptera without being struck by the singular abundance, in flowers, of the little insects forming this homogeneous group, and at the same time the great variation to which some of them are subject. This has led to the description of innumerable varieties. Stephens, in his 'Manual,' enumerates eighteen species, which Mr. Waterhouse has reduced to six, adding at the same time another. I have now to add one more to the list, making eight in all, and to call attention to the characters which distinguish the species, at the same time pointing out one or two others not unlikely to occur in this country. For all minute details it will be necessary to consult Mulsant's '*Coleoptères de France, Longipèdes*,' 1856.

The species may be roughly divided by their colouring as follows:—

- A 1. Elytra and thorax black. *Frontalis*, *rufilabris*, *monilicornis*, *pulicaria*.
- A 2. Elytra black; thorax red. *Thoracica*, *ruficollis*.
- A 3. Elytra black, spotted with yellow. *Fasciata*.
- A 4. Elytra ochreous, sometimes with dark spots. *Flava*, *arctica*, *subtestacea*, *melanopa*.

1. *A. frontalis*, L., Muls. $1\frac{1}{2}$ —2 lines. Black; front of the head, base of antennæ, femora and anterior tibiæ yellow. Appendices of the male elongate, curved at their apex; fifth ventral segment foveolate. Very common in all flowers from May to July.

2. *A. pulicaria*, Costa, 1853 (*forcipata*, Muls. 1856). $1\frac{1}{4}$ — $1\frac{2}{3}$ line. Black; mouth and anterior legs yellow. Antennæ with the joints elongate. Appendices of the male elongate-linear, reaching beyond the fifth segment, which is bilobed.

By no means rare in summer on various Umbelliferæ. Its smaller size and black front distinguish it readily from frontalis. Mulsant has given this insect the name of forcipata, and, seeing that he quotes Costa's description, and indeed was in possession of his type, there can be no doubt that this name must be restored.

3. *A. rufilabris*, Gyll. 1825, Muls. $1\frac{1}{4}$ — $1\frac{2}{5}$ line. Black, pubescent; mouth, base of antennæ, and a portion at least of the tibiæ paler. Antennæ with the last five joints moniliform. Appendices of the male linear, reaching the fifth segment, straight. Hitherto rare. I have only seen specimens from Cambridge and in Mr. Edleston's collection.

These three species are closely allied, and generally confounded together; the colouring is, however, pretty constant, and the male characters are very distinct. There is yet a fourth species which will undoubtedly occur, the *A. monilicornis*, Muls., which has the colouring of rufilabris, but the male has no appendages, and has the first joint of the anterior tarsi equal to the second, while in *A. rufilabris* it is much shorter. Thomson, in the sixth volume of his useful work, points out considerable differences in the sculpture of the three insects, which can hardly have escaped Mulsant; according to him *A. rufilabris* is much more evidently strigose, especially on the thorax, and *A. monilicornis* is obsoletely so, the thorax being nearly smooth. Further observation is required to confirm this.

4. *A. ruficollis*, F. 1792, Muls. (*lateralis*, Gyl., Thoms.) $1\frac{1}{4}$ — $1\frac{1}{2}$ line. Black; labrum, palpi, base of antennæ, legs and thorax reddish yellow. Appendices of the male linear, slightly curved; tarsi simple. This species is generally very common, and varies but little.

5. *A. fasciata*, Forst. 1771 (Geoffroyi, Mull. 1824, Muls.) 1 — $1\frac{1}{2}$ line. Black; base of antennæ and mouth testaceous; elytra with a humeral yellow spot, sometimes with an apical one also; rarely the yellow is in excess and extends to the thorax, leaving the base of the elytra and a marginal spot black. Appendices of the male none; tarsi dilate. Very common in spring, and very variable. Stephens founded numerous species upon its variations; they are, however, generally easily recognisable. It was first described by Geoffroy and next by Forster, whose name must be retained:

the "*double emploi*" complained of by Mulsant is due to the after-use of the name "*fasciata*" by Fabricius for another species, now a true *Mordella*.

6. *A. thoracica*, L., Muls. $1\frac{1}{4}$ — $1\frac{3}{8}$ line. Black, with the head, base of antennæ, and thorax testaceous. Appendices of the male straight, elongate; tarsi simple. Local, but at times not rare. Varieties occur nearly entirely testaceous: these are considered by Thomson as the *flava*, L.; Mulsant, however, describes this as a separate species. Testaceous; elytra obscure at apex; pygidium, breast and abdomen black. Appendices of the male none; tarsi dilate.

7. *A. subtestacea*, Steph., Muls. 1 — $1\frac{1}{2}$ line. Pale testaceous; eyes, apical joints of antennæ, and abdomen beneath black or brown. Appendices of the male linear-straight, springing from the second segment; also a bifid appendage to the third segment; tarsi dilate. Local: I have taken it near London and at Weston. This species is closely allied to *A. flava*, L., and *A. arctica*, Zett., but may be known by the characters of the male, the testaceous colour of the breast and pygidium.

A. arctica, Zett., a species very likely to occur in Scotland, has the coloration of *A. flava*, except that the elytra are more nebulous; the male, moreover, has the usual appendages and simple tarsi; the antennæ are also more elongate.

8. *A. melanopa*, Forst. 1771 (*maculata*, Fourc. 1787, Muls). $1\frac{1}{4}$ — $1\frac{1}{2}$ line. Testaceous; eyes, apex of antennæ, breast, and abdomen beneath black; elytra with three obscure dark spots, sometimes one or more being obsolete. Appendices of the male linear, reaching to the end of the fifth segment; tarsi dilate. Very common in early spring, and easily recognised.

Mulsant has not here attended to priority with his usual care: the careful descriptions of Forster certainly merit that his names should be retained; yet hitherto nearly all of them, though for the most part English species, have been ignored. Mr. Wollaston has, however, restored them whenever he has had to deal with them. The sexual characters above noticed consist of two long linear appendages to the third ventral segment, reaching to the fifth; in a few another short pair will be found on the fourth. These segments are also variously bilobed, and in three species are without

appendages. Our system of carding renders these distinctions difficult to estimate, but they are very apparent in specimens mounted on one side, which is the normal position they seem to assume on the gum.

G. R. CROTCH.

University Library, Cambridge,
February 8, 1866.

Description of the Larva of Sphinx Ligustri. — The eggs are laid singly, on the leaves of *Ligustrum vulgare* (privet) and *Syringa vulgaris* (lilac), in June, and the young larvæ emerge in about fourteen days; at first they have a rough surface, like shagreen, but after moulting become perfectly smooth: I have had examples of this larva seven weeks in that state, and have only observed a single moult, but it seems scarcely credible that only one should occur. It is full-fed in August and September, and is then one of the most beautiful of British larvæ. It rests with the anterior segments elevated and arched, the head tucked in, the legs closely crowded together, its attitude having a distant resemblance to the Egyptian statues of the Sphinx, whence the name of the genus. Head narrower than the 2nd segment, into which, when at rest, it is partially received, rather rough, the face flat, the outer margin of the cheeks convex, the crown slightly notched: 2nd segment narrower than the 3rd and 4th, which are dorsally gibbous; the remainder of the body uniformly cylindrical; the limits of the segments marked with some distinctness, and each divided transversely into eight sections: the 12th segment bears a dorsal horn, slightly and elegantly curved, scabrous, and having a very acute tip. Colour of the head dull green, with a dark purple, almost black, exterior margin to the cheeks: body of a delicate apple-green; the 2nd, 3rd and 4th segments without markings; the others, that is the 5th to the 11th, both inclusive, with an oblique stripe on each side, which is of two colours arranged longitudinally, the upper margin delicate violet, the lower pure white, the white continued in the same direction in four minute dots; the spiracles are yellow, with a reddish centre, and adjoin the lower margin of the white

portion of each stripe; the dorsal horn is black above and at the tip, yellow beneath for two-thirds of its length; legs dingy white, spotted with black; claspers and ventral surface concolorous with the back. In August, or sometimes as late as September, it descends the tree on which it has been feeding, and undergoes a great change in colour, the green, white and lilac colours fading, and the entire surface being more or less pervaded with a dingy brown; it now commences crawling with restless activity over the surface of the ground, never attempting to ascend any tree or shrub, and continues this occupation sometimes for two or three days, and until it has found a suitable spot for burying itself in the earth, in which it forms a smooth walled cell, and, concealed therein, undergoes its change to a pupa: this is perfectly smooth, and of a rich brown colour; the trunk-sheath detached, except at the base, its apex somewhat clavate; the anal extremity is furnished with a curved horn, smaller than, but in other respects resembling, that of the larva. I am indebted to Mr. W. J. Rowe for the opportunity of describing this common but very beautiful larva.—*E. Newman.*

Entomological Notes and Captures.

Prior Appearance of Male or Female, &c. — I have just been reading Mr. Greene's remarks (Entom. iii. 21) respecting the time of appearance of the sexes of the Lepidoptera, and I cannot agree with him in the opinion which he has expressed. For more than thirty years I have paid pretty close attention to our Lepidoptera, and I am convinced that, as a general rule, the males appear before the females. I allude, of course, to the first appearance of each species in the perfect state, because, when specimens continue to emerge for three or four successive weeks, the sexes appear simultaneously the latter portion of the time. Lewin, in his work on the British butterflies, after describing the larva and pupa of *Thecla Betulæ*, says, "The male butterfly appears on the wing about the middle of August; the female is nearly fourteen days later before it comes from the chrysalis;" and I have repeatedly proved the accuracy of this statement. What Mr. Greene says about the sluggishness of

the females will only apply to a small portion of the Lepidoptera, as the females of most of the Noctuæ are nearly or quite as active as the males, and this is certainly the case with a large portion of the butterflies, yet in such common species as *Janira* and *Tithonus* you seldom, if ever, see a female till a week or ten days after the appearance of the males. *Lycæna Ægon* swarms in certain spots by the side of our forest, but you cannot find a female till the males have been out at least a week; but when they do emerge from the pupæ they are readily seen, as they sit on the stems of grass, &c., expanding their wings. Mr. Greene has entirely overlooked the important fact that the female soon ceases to be attractive to the male: in a state of nature I believe copulation almost always takes place within twenty-four hours after the female appears in the winged state, mostly in a much shorter time. I have seen some of the *Bombyces* in copulation before the wings of the female were fully expanded. The females of this family are very short-lived, and are never so attractive to the males as they are on the day on which they emerge from the pupa state; a virgin female of *Bombyx Quercus*, for instance, seldom lives a week, and generally ceases to be attractive to the males in three or four days: if Mr. Greene's theory were correct, hundreds of females must die annually unimpregnated, and it is not probable that this is the case. The time of day or night at which the male *Bombyces* fly appears to be always the same as that in which the females emerge from the pupa state, and I believe in most cases copulation takes place very shortly afterwards. The prior appearance of the male is not confined to the Lepidoptera: I believe it is the case in nearly all the other orders. Hundreds of *Anthophora Acervorum* breed in the wall of my garden, but I never saw a female of this bee till the males had been out for several days; and the males of the *Libellulæ* (dragon-flies) always appear first. In conclusion, I may just say that I incline to Mr. Andrews' opinion, "that the evidence afforded on this question by insects in captivity is of little or no value."—*Henry Doubleday; Epping, February 3, 1866.*

Prior Appearance of Male or Female, &c. — Mr. Greene does not mistake my meaning when he says (*Entom.* iii. 21) that I seem to think that the evidence afforded on the question

of the prior appearance of male or female, by insects *in captivity*, is of little or no value. I did imply, and still think, that it is not at all satisfactory evidence, by reason of the extremely different climatic and other influences to which, in nine cases out of ten, insects in a state of nature are exposed. Nor does the fact of its being the only evidence we can obtain (even if true) prove that it is at all reliable. Possibly there is no such evidence at all at present, within our reach, by which to decide the question. At the same time, granting the comparative scarcity of the females of many species of Lepidoptera and their congeners, I still think that the fact of patient search for the females of such a species as *Endromis versicolor* not being rewarded with success for a week or more after the plentiful appearance of the males, and its being then rewarded with tolerable certainty, and this not in one particular season but in many, must go for something. And I am sure that the observance of this and similar facts, with respect not to this one species alone, but to many commoner and more easily obtained, has until now been accepted, amongst a large class of Entomologists, as ground for the opinion (I do not say positive knowledge) that ordinarily the males appear first. I know this was the common belief amongst the Brighton Entomologists when I lived there, with respect to *Colias Edusa*, the males of which were always most plentiful on the first appearance of the species, and the females afterwards. I have noticed the same thing at sugar in the cases of *Noctua xanthographa*, *Agrotis Segetum*, *A. exclamationis*, and many other species, in some of which the bold and common males entirely disappear, whilst the females continue to come in great numbers and fine condition. I cannot *prove* the point from these instances, it is true; but I can *infer* from the only evidence which Nature, under her own conditions, affords. I do not undertake therefore to *prove* that the males of *Endromis versicolor* emerge from the pupa first; but on the other hand I defy Mr. Greene, or his authority, to prove that the males they have "seen flying wildly and rapidly hither and thither" were in all cases in search of the female, or that on their first appearance there are any females for them to seek. I, too, have never seen the female flying, and am inclined to believe that she seldom or never exercises her beautiful pinions; but by

patient search I have found her alive, at rest, on the heather amongst the birches, and others of my friends have found her clinging to the boles or branches of the birch; in each case this was not until after the males had been out in the same localities for a week or more; and yet these females were in fine condition. I would call on Mr. H. Cooke, the Rev. J. Image, Mr. J. E. Hall and Mr. Crawford Peacock, all of Brighton, to support what I have said as to the facts with respect to *Endromis versicolor* and *Colias Edusa*; and I believe that they will also support me in the opinion I found on those facts, unless their views on the subject have changed since we worked together in 1857, 1858 and 1859. (Rev.) *Percy Andrews*; *Lilleshall Rectory, Newport, Salop, February 13, 1866.*

Prior Appearance of Male or Female, &c.—The emerging of the sexes of *Lepidoptera* still continues to be a problem, and Mr. Greene (*Entom.* iii. 21) takes it for granted that the females emerge first. All the observations I have been able to make are entirely adverse to that opinion, since I have always found the males emerge first; and I think it is so in nature as well as in confinement. I believe the number of males of *Lepidoptera* to be far greater in proportion than the females. That is my theory; but the exact knowledge as to which sex emerges first, in a state of nature, will be very hard to attain: I cannot see how it can be satisfactorily proved. I think that in confinement the males first emerge. I do not think the females can long retain their eggs; so that if they were, as a rule, to emerge first, their eggs would prove barren. I append a summary of emergences in which the male first appeared, and in which the female did so: it is a fair criterion, as there were not less than six pupæ in each species, in some many more. In twenty-four species the male emerged first; in eight species the female appeared first. Species in which the male first appeared:—*S. Populi*, *S. Ligustri*, *C. Elpenor*, *C. bifida*, *C. vinula*, *N. cucullina*, *D. cæruleocephala*, *P. Monacha*, *O. antiqua*, *O. gonostigma*, *L. auriflua*, *H. dominula*, *C. villica*, *P. fuliginosus*, *B. Rubi*, *B. Quercus*, *B. Trifolii*, *E. Lanestris*, *T. Cratægi*, *S. Carpini*, *A. Leporina*, *A. Aceris*, *E. lichenea*, *C. Chamomillæ*. Species in which the female first emerged:—*L. dispar*, *A. Caja*, *D. mendica*, *O. potatoria*, *B. glandifera*, *D. carpophaga*, *D.*

Cucubali, H. Serena, A. Ligustri. This statement only the more confirms my belief that the males of all the species first emerge, with a few exceptions.—*J. S. Dell*; 121, *Navy Row, Morice Town*.

Development of the Wings of Lepidoptera.— I have often watched with intense interest the gradual expansion of the wings of a lepidopterous imago directly after it has left the puparium. On several occasions I have noticed the bag-like appearance they assume when about half-expanded, and on a careful examination I found that the wings were formed of two skins, which were kept separate, during the time of their expansion, by a fluid which was forced between them through an orifice at the base, and which was gradually absorbed and formed part of their substance. I also found that the perfect development of the wings depended very much on a full supply of this fluid, and on the skins being kept separate. If they were pressed so as to cause them to adhere, or an incision made in them, allowing the fluid to escape, a cripple was the result. Any Entomologist may satisfy himself of the correctness of these observations by removing the wing of a large moth and carefully dissecting it. Take, for instance, the half-formed wing of *Acherontia Atropos*. Having made an incision down the costal margin, carefully separate the two skins; in doing so the veins will be laid bare, and may be separated from the wing by a fine pin. If the wing is now placed under the inch-power of a microscope, each vein will be seen to be beautifully branched. A still higher power will show their compound structure, each vein being composed of an outer tube, through which passes a spiral nerve, which with ease may be drawn from the tube. The whole forms a beautiful subject for microscopic examination.—*Henry Moncreaff*; *Southsea*.

Influence of wet Winters on Insect Life.— The Rev L. Jenyns, in his interesting 'Observations on Natural History,' expresses a conviction that rainy winters are much more destructive to insect life than frosty ones, even severe cold producing little or no effect upon hibernating insects, while heavy rains drown them in their burrows. I cannot help thinking that the influence of intense cold is here somewhat underrated. However this may be, it would be worth while to note, during the coming season, if the recent heavy rains

and floods produce any marked diminution in those species of insects which pass the winter beneath ground, as compared with those which hybernate in sub-aërial retreats. And the comparison will be a fairer one if the winter should pass over without severe frosts. — *W. H. Groser* ; 19, *Claremont Square, Pentonville, January 24, 1866.*

Papilio Pammon: its alleged Polymorphism. — *Papilio Pammon* is very common in the Sewalik range of the Himalayas, at the point where the Ravee enters the plains of the Punjab, not being by any means so abundant farther west. It is double-brooded, and is generally found hovering over *Adhatoda Vassica*, which I suspect to be the food-plant of its larva, though I have never come across the latter: the first brood appears in April and May; the second, and by far the less numerous, in October. What has struck me, in connexion with its alleged polymorphism, is that *Papilio Polytes*, its female form, has never been remarked by me as occurring in company with its second brood, though it is on the wing together with the first brood of *P. Pammon*. The tailless form of *P. Theseus*, and its variety *P. Romulus*, have never been observed by me. In the station of Sealkote, situate in the plains, twenty-six miles south of the Sewalik, I have captured several specimens of *P. Polytes*, but never one of *Pammon*. *P. Polytes* I have also taken at greater altitudes than *P. Pammon*, and later in the season; these, however, might have been stragglers. *P. Theseus* also occurs in the Sewalik, but not in any numbers. The result of three years' observations leads me to believe that *P. Polytes*, at all events in this part of the Punjab, occurs both farther in the plains and higher up in the Himalayas than *P. Pammon*. — *A. Young* ; *Arcilli, Madhopore, Punjab, December 23, 1865.*

Gonepteryx Rhamni in January. — I have this day seen a specimen of *G. Rhamni* flying in the sunshine. — *H. J. Just*, *jun.*, *January 23, 1866.*

Colias Edusa, var. *Helice*, in *Sussex*. — On the 9th of June, 1865, my brother captured a specimen of *Colias Edusa*, var. *Helice*, as it was flying over a piece of wheat in this parish. This is a larger specimen than any of the few I have myself seen, measuring in the expanse of the fore wings two inches four lines. *Colias Edusa* not generally appearing here before the third week in August, the occurrence of this variety so

early is surely a remarkable circumstance. — *W. Borrer, jun. ; Cowfold, Sussex, January 23, 1866.*

Vanessa C-Album in Winter. — I captured a specimen of the above insect, in very fair condition, to-day (9th January), while walking with two friends along the turnpike-road leading from Great Malvern to the Rhydd: it flew quite briskly, apparently as fast as they do in the summer. I was much surprised to see it on the wing, particularly as this is one of the coldest days we have yet had: it is true the sun was shining at the time, but it was freezing quite sharp in the shade. C-Album was very plentiful about this neighbourhood last autumn; I saw as many as fifty at a time in a neighbour's garden, feeding on the fallen fruit. — *W. H. Harper ; Copsewood, Great Malvern, January 9, 1866.*

Vanessa Urticæ emerging in December. — Is it not unusual for the little tortoiseshell to emerge from the chrysalis in mid-winter? One emerged on the 23rd of December, and another on Christmas Day. They were kept in the kitchen, amongst various other pupæ; but they are the only ones that emerged. — *Stephen Clogg ; Looe, January 8, 1866.*

Larva of Polyommatus Phlæas hybernates. — On the 17th of December last I found a number of the larvæ of *P. Phlæas* feeding on dock and ragwort: they are now hybernating, and are very small. This proves that this species passes the winter in the larva state. — *Henry Moncreaff ; Southsea.*

Acherontia Atropos: does it feed on the wing? — Has any one ever observed this insect taking its food while on the wing? The question has often occurred to me, does this insect take its food like other of the Sphingidæ, by hovering over the flowers and inserting its proboscis into the nectary of the flowers? From the shortness of this organ I should imagine the insect does not hover over the flowers, but settles on the stem, and procures its food by probing, after the manner of the humble-bees. Should any reader of the 'Entomologist' have seen this insect feeding, and will communicate the desired information, other readers besides myself may feel interested in the matter. — *G. Norman ; Hull, January 22, 1866.*

[I imagine the natural food of the death's-head moth to be the honey deposited by bees in their cells, a kind of food which its very peculiar trunk seems to me especially adapted

to extract; but I shall be very glad to hear the opinions of Entomologists on the subject.—*Edward Newman.*]

Acherontia Atropos: success in breeding. — I had sixteen pupæ of this insect, which I placed in oyster-barrels, on the surface of earth carefully sifted and baked, covering the tops of the barrels so as to exclude light (but not air): I kept them in a south window as long as the sun had tolerable power, sprinkling the mould lightly with water every two or three days. When the weather became cold I kept them on a mantel-piece over a fire. The result was that ten "put in an appearance" at irregular intervals during October and November, and I have still one pupa in a lively state. Of the five which died three were more or less injured in the process of exhumation, so that only two fairly died under my plan. Of the ten perfect insects six were males and four females. Four males appeared before a single female emerged. — *C. M. Bonnor*; Minehead, Somerset, January 18, 1866.

Chærocampa Celerio in the Isle of Wight. — One specimen of *C. Celerio* has been taken at light at Ryde, and another bred; the latter came out of the chrysalis on the 28th of December: the gentleman who succeeded in breeding this specimen was fortunate enough to find a brood of larvæ on a vine. — *James Ingram*; St. Helen's Schools, Nettlestone, Ryde, February 6, 1867.

Sterrhæa Sacraria near Cowfold, Sussex. — A specimen of this insect was taken by myself towards the end of the second week of July, 1865. It has the oblique transverse stripe of a brilliant lake; the inner margin of the hind wings is tinted with a delicate rosy hue, gradually passing into the faint straw-colour which forms the pervading tint of the insect; the antennæ are pectinated for about three-fourths of their length, the remaining portion being simple to the naked eye. It was taken in a net, whilst flying by twilight, in a private garden in this parish. — *William Borrer, jun.*; Cowfold, Sussex, January 23, 1866.

Sterrhæa Sacraria in the Isle of Wight. — A very singular variety of *Sterrhæa Sacraria* was taken at St. Helen's: it differs from the normal form in having a conspicuous pink costal stripe in addition to the oblique pink stripe. — *James Ingram*; School House, Nettlestone, Ryde, February 6.

[It will be found that this very variable species has been

divided into three or four by continental Lepidopterists: the remarkable specimens bred by Mr. Hellins will tend to throw light on this hitherto puzzling question.—*E. Newman.*]

Dasycampa rubiginea in the Isle of Wight.—Eight specimens of *Dasycampa rubiginea* were taken at ivy-blossoms near here from the 23rd to the 26th of October last, both days inclusive.—*James Ingram; February 6, 1866.*

Scarcity of Wasps in 1865.—It is very singular that wasps should have been so plentiful at Brixton and Streatham as Mr. H. W. Neate reports, for at Tooting, which is not three miles from Streatham, they have been very scarce. In 1864 I destroyed thirteen nests, while in '65 I did not find one; but though wasps were so scarce, I never before noticed so many hornets. With us the bees took to eating the over-ripe fruit, as the wasps usually do.—*Edwin Curzon; Grove House, Tooting, February 6, 1866.*

Anchomenus prasinus: has it explosive powers?—It is well known that Clairville and other continental writers have attributed explosive powers, like those of *Brachinus crepitans*, to the above-named beetle; but I have been unable to obtain satisfactory proof of such a property having been exhibited by British specimens. Can any reader of the 'Entomologist' oblige me with information on the subject?—*W. H. Groser; 19, Claremont Square, Pentonville.*

Apion difformis at Southsea.—I have discovered a habitat of *Apion difformis*, and have captured several specimens. Having taken a pair *in cop.*, I find that it is the male only that has the bifid tooth on the epigastrium: the female is very much smaller, and very different in many respects.—*H. Moncreaff; Southsea, December 14, 1865.*

Hydroporus neglectus of Schaum discovered in Britain.—I have during the last fortnight discovered and determined a well-marked water-beetle, as yet undescribed as British.

HYDROPORUS NEGLECTUS, *Schaum, Ent. Zeit. Stett. 1845,*
p. 409.

It is a very distinct species, and is the smallest of our unicolorous *Hydropori*, except *H. Scalesianus*. It is reddish brown, with the thorax somewhat darker, and is most nearly allied to *H. tristis* and *H. umbrosus*. From *H. tristis* it is readily distinguished by its *much* smaller size, the more

depressed but less parallel form, and especially by the sides of the thorax being much more curved, so as to form a considerable angle with the base of the abdomen and elytra. From *H. umbrosus* it is distinguished by its decidedly smaller size, and the slightly depressed but much more elongate and more parallel form; moreover, the margins of the thorax, again, make a much larger angle with the elytra; the head and front are pale ferruginous, as well as the entire legs, which in *H. umbrosus* are mottled with black; the elytra, too, are very much less pubescent, and are more finely punctured. It is impossible to confound these insects, especially when seen in series. I have recently taken a very fine series from a pit near Blackheath. I easily recognised the insect from the description, and also find it identical with some *types* of *H. neglectus* which I obtained from Dr. Schaum. The length is $2\frac{1}{2}$ millimetres.—*John A. Power*; 52, *Burton Crescent*, February 11, 1866.

Nemeobius Lucina bred on the 8th of February. — Upon opening a box on the 8th inst., in which I had last autumn placed my pupæ of *N. Lucina*, I was much surprised to find that two lovely specimens had emerged. — *R. W. Wright*; *Alpha Cottage, Devonshire Road, Hackney, N.E.* Please note my change of address from 168, Richmond Road.

Pygæra bucephala feeding on the Cork-tree. — Mr. Pisto (Entom. iii. 11) expresses surprise at having discovered the larvæ of this moth feeding on the young branches of the cork-tree, and wishes to know if any one else has noticed it under similar circumstances. It may not therefore be uninteresting to him, as well as to other of your readers, to learn that in Portugal, where the cork-tree grows luxuriantly, I have frequently seen it feeding on that tree, and as late in the year as the middle of December; but, contrary to the experience of Mr. Pisto, I observed that these larvæ invariably preferred the older leaves to those growing at the tips of boughs which were of a brighter green and more succulent nature.—*G. F. Mathew*; *Malta*, February 8, 1866.

Myrmedonia plicata at Bournemouth. — Mr. Janson exhibited *Myrmedonia plicata*, *Erich.*, a species new to Britain: a dozen specimens had been captured at Bournemouth in August last, by Messrs. E. A. and Edgar Smith; they were found on an open heath, at the roots of grass, amongst which

was a nest of the ant, *Tapinoma erraticum*. Mr. Janson remarked that the presence, in all the twelve specimens, of the curious conformation of the dorsal surface of the fourth and fifth abdominal segments rendered it probable that this structure was common to the two sexes, and was not peculiar to the male of *Myrmedonia*, as had hitherto been supposed.—*Proc. Ent. Soc., Nov. 6.*

Ægialia rufa at Liverpool. — Mr. G. R. Crotch exhibited *Ægialia rufa*, *Fabr., Erich.*, a species new to Britain, of which several specimens were taken at Liverpool by Mr. F. Archer, but, with the exception of that exhibited, had been accidentally destroyed; also *Lithocharis castanea*, *Grav., Erich.*, which is the *Medon Ruddii*, *Steph.*, whilst the species from the Isle of Wight which is in many of our collections appears to be the *L. maritima*, *Aubé* (*Grenier, Cat. Col. Fr.*); also *Monotoma 4-foveolata*, *Aubé*, of which three or four specimens were formerly taken by Mr. Janson in Hainault Forest, and which was readily distinguished from all the other species by its thoracic foveæ; this name was introduced into the British list by Mr. Waterhouse, but afterwards withdrawn, his insect proving to be *M. rufa*, *Redt.* — *Id.*

Painted Insects. — A few months ago I added a fine male *Sesia Scoliæformis*, as I at first thought it, to my collection; but having some doubts as to its genuineness I placed it under a lens, and then could see grains of colour on the anal tuft: this induced me to wash the insect in camphine, when the colour was instantly removed, and a fine male *Scoliæformis* was changed into a large *Culiciformis*, with the red belt scraped off. The most difficult part to colour is the antennæ: of these it had two, one of *Scoliæformis* and the other of *Culiciformis*, and that of *Culiciformis* had a dash of yellow to correspond with that of *Scoliæformis*. Since I detected this imposition I have seen two similar ones in collections.—*Edward Meek; 5, King Street, Old Ford Road.*

At Home. — Friday evenings, March 2, 9 and 16, from 6 to 9 o'clock. The meeting on the 16th is the last this season.—*Edward Newman; 7, York Grove, Queen's Road, Peckham.*

Duplicates and Desiderata.

I have Wood's 'Zoography,' three vols. old calf, for which I shall be glad to receive offers for exchange for any of the following:—Westwood's 'British Butterflies and their Transformations;' Wood's 'Illustrations of the Linnean Genera of Insects;' Albin's 'Natural History of British Insects;' Harris's 'Exposition of English Insects;' Samouelle's 'Entomological Cabinet;' Newman's 'Introduction to the History of Insects.' In addition to 'Zoography,' I will give 'Sylvan Sketches' for any of the following:—Haworth's 'Lepidoptera Britannica;' Stephens' 'Illustrations of Entomology' (Haustellata); Stainton's 'Manual of Butterflies and Moths;' 'Entomologist's Weekly Intelligencer' (bound or unbound). — *F. Wilkinson; High Street, Market Harborough.*

I bred a few *Orgyia pudibunda* last season, which I shall be most happy to send to any of your young readers, providing they send a small box and return postage. I have also a few *Lycæna Corydon* to give away along with them, if wanted. — *W. Lang; 1, John Street, Hamilton, Scotland, February, 1866.*

I have several specimens of *Vanessa C-Album*, which I shall be glad to exchange for *Colias Edusa*. — *T. G. Priddey; Croft House, Droitwich.*

To Contributors. — The lists, so kindly offered, of Lepidoptera occurring in different British localities are not desired, on account of the space they would require: those in hand will be returned on application. Will intended contributors of similar local lists accept this answer? Before such lists can be interesting they must be denuded of all species of universal occurrence, and the performance of this denuding operation requires considerable judgment.

*** The 'Entomologist' for 1864—5, containing Nos. 1—23, bound and lettered, is now on sale, price 7s. A few copies only remain.

THE ENTOMOLOGIST.

No. 27.]

APRIL, MDCCCLXVI.

[PRICE 6D.

Further Notes on Telephoridæ. By G. R. CROTCH, Esq.

SINCE I first made a communication to the 'Entomologist' (ii. 167) on the characters of the Telephoridæ of Great Britain, I have been able to study them more attentively, and have received numerous types from abroad, as well as many British specimens. I have no new species to record as yet, but a correction to point out, and also to indicate some new characters of considerable service in determining the limits of their variation. I allude here to the impressed smooth line on the joints of the antennæ in the male, hitherto noticed by Thomson only, even Mulsant passing it over without notice. It is not at first readily visible, especially in carded specimens, where all characters of antennæ are generally received, but along the external edge of the fourth and following joints generally exists a small smooth fovea: in the light it is sometimes very conspicuous. The number of joints on which this is present will serve to divide the species.

- | | |
|----------------------------------|---------------------------------------|
| 1. Antennæ simple in both sexes. | Fuscus, rusticus, rufus. |
| 2. 4th—8th joints impressed. | Nigricans. |
| 3. 4th—9th „ „ | Flavilabris, thoracicus, lateralalis. |
| 4. 4th—10th „ „ | Lividus, figuratus, bicolor. |
| 5. 5th—9th „ „ | Hæmorrhoidalis. |
| 6. 5th—10th „ „ | Pellucidus, obscurus, paludosus. |
| 7. 6th—11th „ „ | Assimilis, <i>Pk.</i> |

The above table is compiled from Thomson's work, but I have verified in nearly every instance.

Some of our closely-allied species will thus be seen to be widely separated, and the variable *T. rufus* may be always recognized by its simple antennæ. *T. assimilis*, *Pk.*, is the

only species which has the last joint impressed: this and other characters render it not difficult to recognize. I had, however, been led into error by M. de Marseul, who considered the Scotch examples I showed him to be referable to that species. Mr. Rye first pointed out (Ent. Mo. Mag. ii. 51) that the description of *T. assimilis* did not accord with the insect in question. I have since had more specimens, and an attentive examination convinces me that they must be referred to *T. figuratus*, *Mannh.*, which may then be thus defined:—"Black; head in front, tibiæ, tarsi, elytra and thorax testaceous, the latter with a large discoidal spot black." Its very dark antennæ and black scutellum are good guides to it, for the scutellum of *T. rufus* is rarely dark, even in the most suffused varieties. The male antennæ, moreover, differ considerably. It results therefore that *T. assimilis*, *Pk.*, has yet to be found in Britain: it is a larger and darker species: the sexes generally differ considerably in colouring. The specimens I originally referred to *figuratus* are somewhat of a puzzle: they clearly are not identical with the Scotch species, but I am unable to find anything at present with which they do agree: the discovery of more specimens may perhaps facilitate their identification.

G. R. CROTCH.

University Library, Cambridge,
March, 1866.

Life-history of Trichiura Cratægi.—The eggs are laid in September, on the bark of *Cratægus Oxyacantha* (white-thorn), *Prunus spinosus* (blackthorn), and other dwarf shrubby trees; their shape is that of a long square with rounded corners and a much depressed disk; they are deposited in rows ranged breadthwise and closely approximate; they are often partially covered with down from the body of the mother, but this is not very apparent; the eggs are so arranged that the heads of the larvæ are always in one direction, and the larvæ invariably emerge from one end of the egg: the emergence does not take place until the spring, when the young larvæ, after spinning a web over portions of the food-plant for general accommodation, live together in

company; but as they grow older they separate and feed alone. The larva is full-fed by the end of May or beginning of June, and then usually rests in a perfectly straight position. Head rather narrower than the body, hairy: body almost uniformly cylindrical; every segment from the 2nd to the 13th, both inclusive, has two dorsal warts placed transversely; these are flat and but slightly elevated above the surrounding skin, and in some specimens it is difficult, if not impossible, to detect them while the larva is living; and on each side of each segment, just below the spiracles, is another wart somewhat linear in outline, and equally flat with those on the back; every part of the body is clothed with hairs; those emitted by the dorsal warts are particularly long and conspicuous. Colour of the head black, its hairs gray; of the body black, with an obscure purple tinge especially observable on the sides and in the incisions of the segments; the 2nd segment has a large quadrate dorsal blotch, which, as well as the warts already described, are of an orange-brown colour; on each side of each dorsal wart is a transversely elongate marking of the same colour, but still more brilliant, sometimes of a bright orange; of these lateral ornaments the anterior is invariably the smaller: the ventral surface is grayish smoke-coloured; the legs black; the claspers smoky, tinged with pink; the longer and more conspicuous hairs are black; the shorter and more numerous ones paler, almost white. A very beautiful and very variable larva; in some examples the orange markings on the sides are tinged or irrorated with white, and alternate with pure white amorphous blotches, which form a broad irregular particoloured stripe on each side. The full-fed larva usually descends to the ground in July, and forms a somewhat compact cocoon, attached to roots just below the surface of the ground, or sometimes to twigs lying on the surface. The moth appears on the wing in September. I am indebted for a supply of this beautiful larva to Mr. Doubleday and several other entomologists.—*Edward Newman.*

Description of the Larva of Cucullia umbratica. — The egg is laid on the leaves of *Lactuca virosa* (lettuce), *Sonchus arvensis*, *S. oleraceus* and *S. palustris* (sowthistles), in June and July, and the larva, which emerges in July, devours the leaves of these species, as well as those of the garden lettuce,

sometimes doing great injury to the latter: it eats only by night, and secretes itself by day under those lower leaves which lie prostrate on the ground, or are so bent over as to afford perfect concealment. When full-fed it may be readily found in this situation, reposing in a straight position on the under surface of a leaf, with its back downwards; when annoyed it falls from its food-plant, and twists its head right and left in an angry manner, sometimes stretching it out in a leech-like fashion; but I have not observed it feign death or roll in a ring. Head considerably narrower than the body: body cylindrical, of nearly uniform size throughout, the dorsal surface transversely wrinkled and delicately shagreened. Colour of the head black, but not shining: body dark brown or nearly black, delicately reticulated with pale smoke-colour, the reticulations being depressed, the darker points raised; dorsal surface of the 2nd segment darker than the rest, its margin adorned with seven orange spots, which appear somewhat as the anterior extremities of stripes which have become almost obsolete, but are to be traced along the back and in the region of the spiracles, and three of which appear conspicuously on the 12th segment, and converge at the extremity of the anal flap; ventral surface paler than the dorsal; legs black and shining; claspers black at the base and white at the extremities; their hooks black. Pupa subterranean. The moth appears in June. I am indebted to Mr. Greening for a supply of this larva.—*Edward Newman.*

Entomological Notes and Captures.

Prior Appearance of Male or Female, &c.—In discussing a question in which the natural habits of a living creature are concerned, the utmost caution is necessary to clear the case of all artificial elements which are likely to interfere with a correct decision. The testimony afforded by insects bred in captivity is, I think, of little value as evidence of a general law, because we know many elements are liable to be introduced, the disturbing effect of which may be considerable. Strict observation of insects in a state of nature ought in this case to be our guide; and in addition to this we ought to consider whether there are any exceptional circum-

stances at work, such as peculiarity of season, locality, &c., to exercise an influence. Although we found in captivity a large number of females emerge first, and in a state of nature some few sometimes did, these facts would not prove a general law. The only proof that can be accepted of such general law must be given by Nature herself, with unerring uniformity, perfectly untrammelled by man. It is no answer to say we have not been able to make the necessary observations to establish the law, and must therefore draw our inferences from insects we ourselves may breed. Some might be inclined to think that little or no disturbance from natural law takes place in the breeding of insects. Probably, when an insect is fed from the egg, on a living plant, in the open air, there is no disturbance worth mentioning; and the answers given by such insects, as to their time of appearance, &c., properly averaged by various seasons, might be taken as the voice of Nature. But it is very different when larvæ are taken from their food-plants in all sorts of stages, and their feeding is finished off by providing them with cut branches in confinement. It is no doubt very annoying to a caterpillar to be suddenly jerked off his food, thrust into a close box, and then, after some hours, to find himself among a lot of crowded twigs in a breeding-cage. Who can wonder at some of the creatures thus treated becoming sulky, or even sickening, and refusing their food for some days? In many cases this may cause a delay in their arrival at maturity, and consequently in their emergence in the imago state. It is true that in a lot of larvæ thus treated they all stand the same chance; but some may accidentally fare worse than others, and it is this very uncertainty that we ought to avoid in deciding such a question as this. We do not want to infer this and that; we want to see and to demonstrate. Then again, supposing the pupa is dug never so carefully, in the most approved fashion of our great mentor Mr. Greene, do not the disinterment and exposure, and after treatment of a pupa in our breeding-boxes, introduce a number of disturbing influences, sufficient to upset all grounds of accuracy in the determination of a general law? In this question it is clear we are only safe under the guidance of Nature. But then Nature is so difficult to observe! This is unfortunate for us, but it is no valid reason for giving up our observations.

Most of our field Entomologists have noticed the male first on the wing; but Mr. Greene very truly says, "From this non-appearance of the female on the wing, surely we cannot infer, much less ought we to assert, that it is not in existence." I offer the following fact, however, as really some proof. For the last seven or eight years I have regularly visited a locality in which *Melitæa Artemis* is abundant: for the first week only males were seen, although the females have been most perseveringly looked for among the grass, &c.: daily visits showed that the males were wholly occupied in the sunshine in visiting flowers, on which they long rested: but in about a week the scene became changed, for the females had appeared; most of them were seen sitting on the grass-stems, &c., and the males were roused to unwonted liveliness, no longer attracted by the flowers, but by the fresh-born females. I have closely scrutinized these females, and found they had apparently just emerged from the chrysalis, and some of them were unable to fly, from their wings not having become sufficiently rigid. This is of course only one fact, but it is a fact, and not merely an inference; and I think we may therefore conclude that at least the male of *M. Artemis* emerges generally about a week before the female. I have also observed the males of *Arge Galathea* out some days before the females, but have not been able to verify so conclusively, as in the case of *M. Artemis*, the freshness of the emergence of the female, though they appeared quite bright, while some of the males were slightly rubbed. I would suggest that in seeking for the means of solving this question, preference be given to insects which complete their metamorphosis and emerge in one season, rather than those which pass the winter in the pupa state, as in this latter case elements of uncertainty are liable to be introduced. — *Joseph Merrin; Gloucester.*

Prior Appearance of Male or Female, &c. — If I might presume to step in between the contending parties on the "vexed question" of priority of appearance of male or female among the Lepidoptera, I would suggest a plan, the adoption of which, on an extensive scale, might lead, I think, to a satisfactory solution of the difficulty. I agree entirely with Mr. Greene that there is very little prospect of arriving at the truth by studying the times of *appearance* of the males

and females respectively in a state of nature. That the males, in a state of nature, do *appear* first, seems to be a fact established on general experience. But from this fact of their prior *appearance* we cannot safely infer, as has been too commonly inferred, their prior *emergence*. The retiring habits of the females, and their domestic duties, would fully account for their not appearing so soon as the males. How, then, are we to get at their times of emergence? I answer, by observations made on them *in captivity*. This Mr. Andrews regards as a method "of little or no value," because probably he only thinks of indoors captivity; but I am thinking of out-of-doors captivity. Let your flower-pots and breeding-cages be placed in some shed or summer-house, open to the air, and only about as much sheltered from the weather as insects generally like to be. This may be called *captivity*, but it has always appeared to me that a pupa inside such a shed would observe the same times and seasons as a pupa outside; and if it were the habit of the male pupæ to emerge before the females, they would do so as certainly inside as outside. In such a place as this, then, the Lepidoptera may be studied, as far as regards their emergence from the pupa state, with as much satisfaction, to most minds, as if one could witness and note down the emergence of every moth throughout the season in any large wood. Let the shed be *in* a wood, if you like, *with one end quite open*, and who would think it likely, or even believe it possible, that the pupæ on one side of the wall would follow a different law, as to the priority of emergence of males or females, from those on the other? Therefore, I repeat, we have the means of arriving at a just conclusion on this question. Entomologists have only to keep their pupæ in the open air, and make observations. We shall then have Nature's own solution to this question in a few seasons, and probably by the end of the season now commencing shall be able to make a good guess what that solution will be. — (Rev.) E. Horton; Powick, Worcester, March 1, 1866.

Prior Appearance of Male or Female, &c. — I was very glad to find, from the last number of the 'Entomologist,' that my observations on this question had elicited three replies, though my satisfaction was considerably damped by finding that the opinions expressed by the three writers were all

adverse to my own. Everyone recognizes Mr. Doubleday's right to speak *ex cathedra* on any question connected with British Lepidoptera, few having had his lengthened experience, or exercised the same patient and unwearied observation. I should be slow therefore to form an opinion opposite to his, and still slower to express it, unless I had, as I thought, very strong reason for doing so. With this proviso, I must say I cannot at all agree with his assertion (Entom. iii. 36) that the females of most of the Noctnæ are "nearly or quite as active as the males." This is a question of mere personal observation. During the whole period that I have collected I have been struck with the comparative scarcity, in a state of nature, of the females of all Orders of Lepidoptera, except the butterflies. Taking the usual methods, natural or artificial, of attracting moths, I have always understood it to be an acknowledged truth that the proportion of females thus captured was very small indeed, compared with that of the males. Assuming this to be correct, we cannot reconcile it with the alleged fact that the females are as active as the males. Take, for example, moths attracted by "light." For eight years I was in the habit, during the season, of sitting up, night after night, from 11 A.M. to 2 P.M., for this purpose, and I have no hesitation whatever in saying that ninety per cent. of the insects thus captured were males. I think the same to be true; though perhaps in a less proportion, of moths taken at sugar, ivy, sallows, &c. In the last number of the 'Entomologist's Monthly Magazine,' Mr. Barrett gives an account of a number of *Taniodampæ* captured by him at sallows in the spring of '65. Should these lines meet his eye, I shall feel much obliged if he would write a line to say what was the proportion of males and females, of course excepting those of the latter which he specially looked for. Surely it will be admitted that females are rarely taken on the wing, especially among the Bombyces. Are not the females of the Noctnæ and Geometræ, as a rule, taken either by beating or by searching for them in their lurking-places? I do not now speak of breeding, by which method, I suspect, the great majority of females find their way into our collections. For these reasons I must still adhere to my opinion that the females of all moths are much less active than the males. I quite agree, however, with Mr. Doubleday in saying

that this does not hold good with the butterflies. I agree also with him in thinking that among them the male generally emerges first, as in *Anthocharis Cardamines*; and that therefore my theory fails, so far as they are concerned. I may say, however, that that theory, right or wrong, was intended to apply to moths, and not to butterflies. In regard to some other parts of Mr. Doubleday's communication, I think he takes too much for *granted*. He expresses his opinion "that the evidence afforded on this question by insects in captivity is of little or no value." How, *without* this evidence, does Mr. Doubleday prove that "the female soon ceases to be attractive to the male;" that "the females of this family are very short-lived, and are never so attractive to the males as they are on the day on which they emerge;" that "a virgin female of *Bombyx Quercus* seldom lives a week, and generally ceases to be attractive to the males in three or four days"? Even admitting all this to be true, I must dispute the conclusion drawn therefrom, *viz.*, that if my theory were correct hundreds of females must annually die unimpregnated. Why so? Mr. Doubleday admits that a female *Quercus* is attractive for three or four days. Surely, then (on his own showing that pairing takes place as soon as possible), during this period plenty of males may have emerged, and the expectant female need not be left without a mate? Had I indeed expressed an opinion that the females emerged a week or ten days before the males, then *supposing* the former to be so short-lived, the argument would have some force. But I never ventured to propose any limit. I merely suggested that the females emerged *first*. But I object, farther, to the statement that the females *are* so short-lived. All my observation goes to show that the female is longer lived than the male. This can easily be tested by placing a male and female of the same species in separate boxes, and seeing which is the survivor. Should the latter survive, it may be said that she does so only because she has had no opportunity of pairing. Precisely. And if this be so in a state of captivity, why not in a state of nature? That is, *if* the females, in a state of nature, do frequently emerge a day or two, or even more, before the males, why may their life not be sustained until the latter are ready for them? Again, I think that the assertion, as to the females

always emerging from the pupa at the same time that the males begin to fly, cannot be verified. I speak now of insects bred in captivity. It certainly is not the case with a vast number of Noctuæ and Geometræ. True, Mr. Doubleday confines his observations to the Bombyces. Yet, even there, the genera *Cerura* and *Clostera*, not to mention others, emerge during the daytime, the former generally in the afternoon the latter in the forenoon. Mr. Hodgkinson, who has been so successful in taking *Cerura bicuspis*, tells us that he finds them just emerged from the pupa about 3 P.M.—With regard to Mr. Andrews' communication (Entom. iii. 36), I think he makes out a very good case as to *Endromis versicolor*. I was not aware that the female was so commonly taken as it would appear to be from his statement; but, that being so, and the female *never* being found till a week after the male, is fair and legitimate evidence of the prior appearance of the latter. I am sorry that Mr. Andrews is still of opinion that the evidence afforded by insects in captivity is of little or no value. He bases this opinion on the fact that insects in a state of nature are exposed to extremely different climatic and other influences. Doubtless. But surely those influences act differently on the males and females? I have not seen a vestige of proof given why the prior appearance, whether of male or female, in captivity, should not be fair inferential proof of the same obtaining in nature. All the pupæ are kept in the same cold room. Granted that the temperature indoors is different from that out-of-doors,—granted *any* influences, known or unknown,—yet that temperature, those influences, must act equally on males and females. They cannot retard or accelerate the appearance of one more than the other. — Mr. Dell, in his observations (Entom. iii. 38), charges me with "taking it for granted" that the females emerge first, and he refers your readers to my last communication (Ent. iii. 21). I see nothing whatever there to justify this statement. All I say is, that, so far as my experience goes, the females generally emerge first in captivity, and that from this I think it a fair *inference* that they do the same in a state of nature. Mr. Dell fails to see that he takes a precisely similar line of argument himself. Finding that in *his* case the *males* emerged first in a majority of instances, he concludes thus: — "This statement only the more confirms

my belief that the males of all the species emerge first, with a few exceptions." I differ entirely from him in thinking that the males of Lepidoptera are far more numerous than the females. As I have argued, we see much fewer of the latter in a state of nature, but when bred in confinement I think it will be found that they bear a pretty close proportion to each other. There is valuable evidence on this head given by Mr. Birchall (Entom. ii. 337). In five large broods the proportion was—

	MALES.		FEMALES.
L. caniola ('64).....	52	...	49
„ ('65).....	150	...	150
C. fascelina	25	...	23
A. prodromaria	19	...	19
D. capsophila	24	...	23
	<hr/> 270		<hr/> 263

Thus, out of 533 specimens, there was a preponderance of only seven males. I conclude with reiterating my earnest request that, during the forthcoming season, your readers will carefully observe whether the males or females emerge first in their breeding-cages. It will not be necessary to carry the observations farther than the first two or three days of the appearance of each species.—(Rev.) J. Greene; *Cubley Rectory, Uttloxeter*.

Query respecting Chærocampa Porcellus and C. Elpenor.—Are the above likely to be found so far north as Leicestershire, as I am particularly desirous of adding these pretty Sphingidæ to my collection?—F. Wilkinson; *High Street, Market Harborough*.

Insect-enemy of the Turnip.—Another destroyer of the turnip was a footless grub, of one-quarter to half an inch in length, pointed before and truncate behind, quite white, and with jet-black mandibles. This, which I take to be a dipterous larva, had eaten into the crown of the turnip, between the leaves, and then directly downwards, forming holes as stout as a large knitting-needle; and as from four to a dozen of them would be found in each bulb, they caused sad destruction by admitting air and moisture, and soon caused the turnip to decay.—T. J. Bold, in *Natural-History Transactions of Northumberland and Durham*.

[If Mr. Bold had placed a turnip thus infested on some earth or sand, and then covered it with a bell-glass, the history of this destructive creature would have been learned in a few days. Will Mr. Bold kindly transmit me specimens when they again occur? the trouble of rearing them will be a pleasant one.—*Edward Newman.*]

Hepialus Humuli, var. *thulensis*.—While the subject of *Hepialus Humuli*, var. *thulensis*, is still fresh in the memory of entomologists, it may be well to remind them of the following article, by Mr. George Wailes, in the 'Entomological Magazine,' vol. i. p. 42, published in 1832. This author says of *Hepialus Carnus*:—"I cannot but suspect this to be only an extraordinary variety of *H. Velleda*. Both occur at the same time, in the same places, and the markings seem to run into each other. This genus varies much in the colour and intensity of the markings, and I have taken specimens of *H. Humuli* with the anterior wings of a yellow tinge; and my friend Mr. Hewitson has shown me similar specimens, captured in the Orkneys this season, which have very distinct markings on the anterior wings." It is to the last sentence of this extract that I wish to draw the particular attention of Scotch entomologists especially, for it establishes the fact that, besides the Shetlands, the Orkneys also possess a race of *Hepialus* of their own; and this leads me to speculate that if the Hebrides were searched at the proper time, they would also yield a peculiar local variety of *H. Humuli*; but, lying farther south, their race, although subject to the same effects of isolation, &c., will perhaps represent an intermediate state between the typical form of the mainland and the variety *thulensis*. Has *H. Humuli* ever been taken in the western parts of Ireland? If so, do such specimens vary in any way from normal English ones?—*Albert Müller; March, 1866.*

Lepidoptera bred.—The months of January and February have produced me, from chrysalises dug in October, no less than seven fine specimens of *Notodonta dictæa* (four males and three females), and two females of *Platypteryx falcata* from larvæ taken in August. Towards the end of February a male *Clostera reclusa* also appeared. Of *Tæniocampa instabilis*, *gothica*, *stabilis* and *cruda* I have had abundance. The chrysalises are kept in a sitting-room, where there is

usually a fire, and the moss above them is occasionally damped. — (Rev.) A. H. Wratislaw; *School Hall, Bury St. Edmunds, March 1, 1866.*

Mould on Lepidoptera.—A short time ago I wrote a letter to the 'Naturalist,' soliciting an effectual remedy for stopping mould on the wings of Lepidoptera (Nat. ii. 255); but failing to obtain a reply from any of its contributors, I submit the two following important queries to the readers of the 'Entomologist,' some of whom may have had, like me, but it is to be hoped with better luck, to contend with this disheartening infection, — How is mould to be got rid of? and when got rid of, how is it to be kept clear? I know that dampness is a certain forerunner of mould, but I have studiously avoided this, keeping my cabinet in a dry, airy place, free from all dampness, with a moderate temperature. I have lately been in the habit of keeping a small open phial of benzine in my cabinet, as a preventative against mites. May not this, when it has undergone evaporation, settle on the wings of the insects, and thus cause them to become moist, and eventually mildewed?—*F. Wilkinson; High Street, Market Harborough, February 28, 1866.*

The Weevil in Granaries.—I notice remarks (Entom. iii. 29) about the weevil, and would observe that I never knew them so plentiful (in my granaries at any rate) as they were last year. In May I stored 600 quarters of wheat: finding it much infested with weevil, I shipped 300 quarters in September, and took in 60 quarters of new wheat. This seemed to make matters worse; so in December I put the whole through a machine, and, besides a great quantity of dust, sixteen bushels of weevils were collected. I send you a box full: are they the same as those infesting the barley? Do you think the putting the old wheat and the new (the 60 quarters) together was the cause of the increase of weevil, or whether it was through the continuance of the hot weather? I would observe that the whole of the wheat, from the time it was stored till last month, when the bulk was shipped, had been turned every week. — *David John French; Chatham, February 24, 1866.*

[If the grain, whether wheat or barley, were intended for seed, I believe there would be no great difficulty in destroying the weevils by poison; but supposing the grain intended

as food for man or animals, it would be highly dangerous to attempt the destruction of the insect plague by the use of any poison. With regard to the specific questions asked by my correspondent, whether the mixture of old and new wheat caused an increase of the plague, I may reply that I certainly think not: but this is a subject on which I particularly solicit the opinions of practical agriculturists, and I have now so many of these among my readers that we may expect a prompt and reliable reply. The weevil (*Calandra granaria*) is identical with that previously recorded as infesting barley. — *Edward Newman.*]

Note on a Species of Homalidæ new to Britain. — I have for some time had specimens of an *Homalium* apparently new to Britain, if not to Science, taken in Scotland by Turner; Mr. Janson also had two specimens in his collection, and I believe it is the sp. — ? No. 14, of Mr. Waterhouse's 'Catalogue.' There was evidently no *Homalium* to which it could be referred, and I suspected it might prove to be *Deliphrum crenatum*, *Er.*, though it appeared to me to have no generic characters in common with *D. tectum*. Comparison with continental specimens leave no doubt that it is indeed referable to that species. Kraatz begins his description by saying, "Not unlike *H. brunneum*, but larger," &c.; and it was to the neighbourhood of that species I had always referred it. It is abundantly distinct from any other indigenous species by its size ($2\frac{1}{4}$ line) and its facies, which is precisely that of *H. florale*; the antennæ are however longer, and the elytra punctate-striate; the abdomen is sparingly, but visibly, punctured. *D. arcticum*, a more northern species, appears to be much of the same form, but smaller and hardly punctate-striate. *D. crenatum* has not hitherto occurred in Sweden, and it appears to be rare on the Continent. — *G. R. Crotch; University Library, Cambridge.*

Four new British Alticidæ. — In the 'Entomologist's Monthly Magazine' for March, Mr. Charles O. Waterhouse describes no less than four new British Alticidæ. 1. *Thyamis Longitarsus fuscus*, of Kutschera, differs from *T. brunneus* and *T. minusculus* in being less convex, and more thickly punctured in the elytra. 2. *Thyamis Waterhousei* of Kutschera, when compared with *T. Ballotæ* and *T. Lycopi*, is distinguished from the former by its more glossy surface

and reddish colouring, and from *T. Lycopi* by its larger size, greater convexity and breadth, and by its coarser, and, as regards the elytra, very indistinctly striate punctuation.

3. *Thyamis gracilis* of Kutschera, extremely like a small *T. ochroleucus*, in which the blackish colouring of the apical half of the hind tibiæ is wanting. The thorax is broader than in *T. ochroleucus*, and more than half broader than long, at the sides gently rounded, and with a gentle projection behind the anterior angles. This species is common at Mickleham and elsewhere on *Senecio Jacobææ*.

4. *Psylliodes luridipennis* of Kutschera. Oblong-ovate, of the size and build of *P. Hyoseyami*, but not so broad; head and thorax brassy green; elytra reddish brown, shining, with brassy green legs and testaceous antennæ; the hind femora brassy, pale at the base. Its smaller size, brassy colouring, and more finely and closely punctate-striate elytra will serve to distinguish it from *P. chrysocephala*.

Entomological Prize Essays.—At the February Meeting of the Entomological Society the Prize awarded by the Council for an Essay "On Ailanthiculture" was presented by the President to the author, Dr. Alexander Wallace; and it was announced that the Council renewed the offer of last year, and would give Two Prizes, of the value of Five Guineas each, to the authors of Essays or Memoirs, of sufficient merit and drawn up from personal observation, on the anatomy, economy, or habits of any insect or group of insects which is in any way especially serviceable or injurious to mankind. The Essays should be illustrated by figures of the insects in their different states, and (if the species be noxious) must show the results of actual experiments made for the prevention of their attacks or the destruction of the insects themselves. On some former occasions the Council has selected a definite subject, as *e.g.*, the Coccus of the Pine Apple, the larva of *Agrotis Segetum* (the large caterpillar of the turnip), &c., but on the present occasion the selection is left to the candidates themselves, provided only that the subject be one fairly belonging to the Economic branch of Entomology. The Essays must be sent to the Secretary at No. 12, Bedford Row, indorsed with mottoes, on or before the 30th November, 1866, when they will be referred to a Committee to decide upon their merits; each must be accompanied by a sealed letter

indorsed with a motto adopted by its author, and inclosing his name and address. The Prize Essays shall be the property of, and will be published by, the Society.

Duplicates and Desiderata.

I have a few of the following insects in duplicate:—*L. Trifolii*, *O. Fascelina*, *M. Albicolon*, *H. Pisi*, *N. Zonaria*, and should be glad to exchange them for larvæ or pupæ of *A. Villica*, *H. Dominula*, or any other local species of insects, such as *L. Aureola*, *Helveola*, *Complana*, *Pygmæola*, *Muscerda*, *Quadra*, *P. Palpina*, *P. Plumigera*, *N. Dodonæa*, *Chania*, *L. Cucullina*, *D. Coryli*, *O. Gonostigma*, *T. Cratægi*, *C. Castrensis*, *G. Quercifolia*. — *Wm. Johnson*; 26, *Brenton Street*, *Park Road*, *Liverpool*, *March 6*, 1866.

Having reduced my series, I shall be glad to receive offers for the undermentioned duplicates: — *Edusa*, *Sinapis*, *Gala-thea*, *Semele*, *Tithonus*, *Blandina*, *Davus*, *Iris*, *Cardui*, *C-album*, *Cinxia*, *T. Quercus*, *Argiolus*, *Agestis*, *Tages*, *Linea*, *Sylvanus*, *Atropos*, *Convolvuli*, *Z. Trifolii*, *Loniceræ*, *Filipendulæ*, *Stellatarum*, *Æsculi*, *Dromedarius*, *Plumigera*, *Camelina*, *Cassinea*, *Dispar*, *Fascelina*, *Pudibunda*, *Gonostigma*, *L. Sericea*, *Dominula*, *Villica*, *Cribrum*, *B. Trifolii*, *Laestris*, *P. Populi*, *Pavonia-Minor*, *Falcataria*, *Duplaris*, *Diluta*, *Or*, *Glandifera*, *Littoralis*, *Phragmitidis*, *Anceps*, *Furva*, *Albicolon*, *Connexa*, *Literosa*, *Valligera*, *Saucia*, *Cursoria*, *Nigricans*, *Tritici*, *Præcox*, *Lucerneæ*, *Ashworthii*, *Janthina*, *Fimbria*, *Depuncta*, *Triangulum*, *Umbrosa*, *Rubricosa*, *Upsilon*, *Pistacina*, *Lunosa*, *Vaccinii*, *Spadicea*, *Cerago*, *Ochroleuca*, *Templi*, *Nigra*, *Lichenea*, *Rhizolitha*, *Lithorhiza*, *Luctuosa*, *Fuscula*, *Pyramidea*, *Mi*, *Glyphica*, *Vespertaria*, *Apiciaria*, *Advenaria*, *Maculata*, *Zonaria* (male and female), *Crepuscularia*, *Citraria*, *Gilvaria*, *Ulmata*, *Defoliaria*, *Multistrigaria*, *Cæsiata*, *Albulata*, *Nanata*, *Hexapterata*, *Lobulata*, *Juniperata*, *Rubiginata*, *Albicillata*, *Lignata*, *Dubitata*, *Cervinata*, *Lineolata*, *Imbutata*, *Spartiata*. *Varieties for other Varieties*, *Helice*, *Paphia (black)*, *Cinxia*, *Davus*, *Hyperanthus*, *Cardui*, *Atalanta*, *Adonis*, *Alexis*, *Agestis*, *Alveolus*, *Rurea*, *Grossulariata*, *Hexapterata*, *Cratægata*. — *Alfred Owen*; *The Grove*, *Ventnor*, *Isle of Wight*, *March 19*, 1866.

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Observations on concluding portion of the Curculionidæ, &c.

By G. R. CROTCH, Esq.

AT length the final volume of M. Lacordaire's 'Genera' has appeared, bringing us down to the end of the Rhynchophora. In accordance with the promise of last year's 'Annual,' we may look for a conclusion of the careful analysis of the work there commenced; in the meantime I will offer a few observations on some British genera which have undergone alteration. The relative position of these latter genera has been materially altered, and brought more into accordance with their real affinities; indeed, it is hard to see on what principle *Phytobius* and *Rhinoncus* have been separated wide as the poles, when in fact they are scarcely more than sub-genera.

The genus *Miarus*, regarded by M. Brisout as a sub-genus of *Gymnetron*, is elevated to a separate rank, and on very good grounds, forming as it does an exception to the character of the family. M. Lacordaire also shows that the pectoral groove in the second subdivision of *Gymnetron* has no existence in nature. Schönherr first made the error, and afterwards corrected it; M. Brisout reproduced it, and it thus found its way into these pages, and subsequently into the 'Annual.' *Rhamphus*, after being balloted about in all parts of the list, finally finds its place near *Cryptorhynchus*. It is without question closely allied to *Orchestes*, and is only removed from it on account of its separated coxæ: in the case of *Gymnetron* and *Miarus*, M. Lacordaire has held that the intimate connexion of the two genera should override the difference in the coxæ, and I think the same might consistently have been affirmed here.

The pale-coloured species have been separated from the other *Cæliodes*, under the name of *Megacetes*, by Thomson, a step justified by M. Lacordaire, who gives as the character of the new genus, "pectoral groove extending to the metasternum."

In *Ceuthorhynchus* the division with a six-jointed funiculus is held as being generically distinct, but no other character is adduced; hence it seems to me unnecessary to maintain it. *Phytobius* is brought from the neighbourhood of *Eri-rhinus* and its near allies, *Rhinoncus* and *Amalus*; indeed the two former of these scarcely merit separation.

The genus *Eubrychius* of Thomson is accepted for *Litodactylus velatus*, and some other sections are indicated. The following table will give a clearer view of this interesting little group:—

- A 1. Antennæ 10-jointed; scape short.
- B 1. Tarsi bilobed. *Velatus*.
- B 2. Tarsi filiform. *Leucogaster*.
- A 2. Antennæ 11-jointed; scape reaching the eyes.
- B 1. Thorax faintly emarginate in front.
- C 1. Claws simple. *Canaliculatus*, *Waltoni*, *4-tuberculatus*, *Comari*.
- C 2. Claws bifid. *4-nodosus*, *4-cornis*.
- B 2. Thorax deeply emarginate; claws bifid. *Rhinoncus*.

In the *Cossonides* no change has been made, but the *Scolytidæ* have been subjected to a complete revision by MM. Eichhoff and Chapuis, the result being, as usual, a large increase of genera. The *Hylesinides* are not much altered, save that *Dendroctonus*, as now restricted, contains no English representative; a new genus, *Blastophagus*, having been formed for *D. piniperda*: *D. pilosus* also forms the type of the genus *Carphoborus*, *Eich*. In the *Tomicides* the subdivision has been greater; the two *Xyloteri* are regarded as types of distinct genera, the old name *Trypodendron* being retained for *X. domesticus*, while three new genera have been formed at the expense of *Tomicus*, chiefly on the structure of the oral organs, and comprising the various species not retuse behind. Numerous and important changes are thus inaugurated, more so perhaps than in any other family of *Coleoptera*; and already two other theories are in the field; but the fact that Lacordaire has been able to apply his, more or less successfully, to all the known genera, will ensure its adoption till our material shall again get unmanageable; and indeed, though our knowledge of specific forms will increase

immensely, and with them the number of genera used to contain them, yet our knowledge of the fauna of the world must be now sufficient to form a very fair general sketch of a group, into which new material may be fitted almost indefinitely.

G. R. CROTCH.

University Library, Cambridge.
April, 1866.

Entomological Notes and Captures.

Ticking of the Death-watch. — At a late Meeting of the Entomological Society, Mr. Smith said that a correspondent of his had recently inquired of him whether there was any truth in the statement that the soft-bodied little *Atropos pulsatorius* makes a tapping noise like that attributed to *Anobium*; and the same correspondent also expressed his doubt as to *Anobium* making a tapping noise. On the latter point, in spite of the oft-repeated and commonly received statement that the "death-watch" made a distinct tapping against (say) an old wainscot and on the outside of it, as if for the purpose of notifying his presence to the female within, he (Mr. Smith) shared the doubt of his correspondent, and believed that the only noise made by the *Anobium* was caused by its gnawing the wood internally, and that there was no external tapping at all. He had himself met with instances in which the internal gnawing of wood by insects was distinctly audible, and, in particular, he mentioned the case of a rustic garden-seat from which proceeded a noise like many watches simultaneously ticking, and which was solely caused by xylophagous insects. Several members said that, as they understood the popular account of the *Anobium*, the tapping was not represented as being external; it was the fact of the noise being heard, whilst nothing was visible which could be suggested as producing it, that caused the ignorant to dread the so-called death-watch. — At the next Meeting of the Society, Mr. Smith said the remarks he had made at the previous Meeting, as to the tapping noise alleged to be made by "death-watches," had induced Mr. Henry Doubleday to send him an account which showed that his (Mr. Smith's) doubt was, as to *Anobium* at all events, unfounded. Mr.

Doubleday, under date of Epping, 31st Dec, 1865, wrote as follows:—"I cannot speak positively about the *Atropos*, but I am strongly inclined to believe that it is the insect which produces the continuous faint ticking sound so frequently heard in the spring. It seems almost impossible that such a delicate little creature should be able to produce any sound whatever, but I have always found it in places from which the ticking sound appeared to proceed. I have often thought it very wonderful that the pied woodpecker can, by striking the branch of a tree with its beak, produce a sound which may be heard for half a mile; we could not produce a similar sound by striking the tree with a stick or anything else. I can speak positively with regard to the *Anobium*, and I assure you that this little beetle produces the loud ticking sound, by raising itself upon its legs as high as it can, and then striking the head and under part of the thorax against the substance upon which it is standing, generally about five or six times in rapid succession; and it always chooses a substance which produces the most sound. It is evidently a call-note from one individual to another, as you very rarely hear one rap without its being immediately answered by another. I have repeatedly kept one in a card pill-box, and if I imitated the sound, by tapping anything with a pointed pencil or something of that kind, the *Anobium* would instantly answer me. This insect is common in our house, but it is not very easy to obtain them, as, when you have found out by their rapping where they are, they drop the instant you move anything near them. If all is well I will endeavour to obtain you some bye-and-bye, and send them to you alive."

Psocus bred from Atropos pulsatorius.—I am reminded by the preceding reference to the death-watch that last October I bred a great number of a minute *Psocus* from the insect usually known as *Atropos pulsatorius*. These mischievous creatures having been ejected from insect-boxes by the abundant application of benzole, apokatharticon, and other odorous fluids, took refuge amongst my ferns, and, having reduced them to skeletons, stuck themselves up as high as possible on their legs, and splitting open longitudinally down the thorax and upper segments of the abdomen, emerged as *Psocus pulicarius* or some allied species. Forty years have

elapsed since I published this as a matter of opinion ; I now record it as a matter of fact.—*Edward Newman.*

Anaspis rufilabris in *Dunham Park*.—During the past three months I have taken several specimens of this rare species in Dunham Park ; they occur in the old dry stumps on living oak and beech trees. — *R. S. Edleston ; Bowdon, April 5, 1866.*

Melasis buprestoides in *Dunham Park*.—Last week I met with an extensive colony of this species in a dead birch tree in Dunham Park : like some other wood-feeding species, they vary in size in a most extraordinary manner ; with the exception of *Cossonus Tardii*, I have met with none to equal them in this respect.—*Id.*

Polydrosus Chrysomela at *Morecambe Bay*.—In June last this species, along with *Cillenum laterale*, was very abundant on the wet sand left by the tide at Humphrey Head, Morecambe Bay.—*Id.*

Leptinus testaceus at *Grange*.—I received from a friend at Grange, on the 15th of March, a specimen of this species, which he found upon a dead mouse lying in the road a mile from Cartmel.—*Id.*

Mycetophagus piceus at *Dunham Park*.—A colony of this variable and pretty species occurs in the yellow decayed powder of a living oak in Dunham Park.—*Id.*

Megatoma undata.—On the 16th of February, under oak-bark, I met with a specimen of this beautiful beetle before it had left the pupa-case ; the latter is exceedingly pretty, striped in chocolate and brown.—*Id.*

Omalius septentrionis.—I have recently found a single example of this insect, among some captures made by myself in the Isle of Arran, in August, 1864. Of the recorded British species it bears most resemblance to *O. rivulare*, from which it is readily distinguished by being much more strongly and closely punctured, and less shining, with its elytra narrower in proportion to the thorax, the sides of which are less rounded ; and by the five basal joints of its antennæ being red. Its much stronger punctuation, independently of other characters, distinguishes it at a glance from *O. riparium*, which it somewhat resembles in build. — *W. Henderson, in Ent. Mo. Mag., Feb. 1866.*

Prior Appearance of Male or Female, &c.—With regard

to the controversy now pending on the relative priority of the emergence of males or females from the pupa, I may just mention the results of a large brood of *Nonagria geminipuncta*. These were collected, by my brother and myself, in the pupa state, by cutting them from the reeds, leaving them however in the stems, which were placed upright in damp sand: in this way they emerged after a few days, and could scarcely be said to be affected by captivity. The males appeared first, inasmuch as no female appeared the first two days, and about the last two there were no males. They all emerged about 4 P.M., and crawled up the stalks to dry themselves, the males taking flight at dusk; and I should imagine many were lost in this way, as the reed-bed was the nightly resort of large flocks of small birds, which appeared to roost there. I will only mention, finally, that this is some four or five years ago, but the facts were noted down at the time.—*G. R. Crotch; University Library, Cambridge.*

Prior Appearance of Male or Female, &c.—My experience of thirty years in breeding Lepidoptera, from *Papilio* to *Nepticula* (the breeding-boxes and glass jars kept out of doors, simply protected from rain), amounts to this,—Males appear first. Take field experience,—and few people have had more than myself,—the result is the same; for example, *Melitæa Artemis*, *Erebia Cassiope*, *Satyrus Hyperanthus*, *Chortobius Davus*, *Lycæna Egon*, *L. Alexis*, *L. Alsus*, *L. Agestis*, *Nemeobius Lucina*, *Ino Statices*, *Zygæna Trifolii*, *Z. Filipendulæ*, *Euthemonia Russula*, *Chelonia Plantaginis*, *C. caja*, *Bombyx Quercus*, *B. Rubi*, *Saturnia Carpini*, *Dicranura bifida*, *Notodonta camelina*, the *Taniocampæ*, *Amphydasis prodromaria*, *A. betularia*, *Fidonia atomaria*, *Larentia imbutata*, the *Hybernæ*, the *Pyalides*, *Tortrix Gerningiana*, *T. Walkerana*, *T. lepidana*, *T. rusticana*, &c.: in all these species the males are the first to appear in their widely-different habitats—meadows, woods, bogs and mountains. Mr. Doubleday's assertion, that the males commence flying when the females come out of the pupæ, is not correct; the females are out and fully stretched for some time before the males commence flying: take common illustrations in the two species *B. Quercus* and *S. Carpini*; both come out early in the forenoon, and the males fly after midday: *C. caja* comes out during the day, but the males are not attracted

till midnight; *A. prodromaria* and *A. betularia* come out early in the afternoon, the males being attracted soon after dusk. There is a remarkable fact attending these virgin females; they have the power of attracting the males or not, as they feel inclined: this is easily proved by observing a few virgin females of *S. Carpini* or *B. Quercus*, where males are abundant.—*R. S. Edleston; Boreton, April 6, 1866.*

Prior Appearance of Male or Female, &c.—I wish to say one word on this subject. It seems to me that it does not make the slightest difference where or how the pupæ are kept: whether they are forced in a hot room, or retarded in an ice-house, the same influence must necessarily affect both male and female in exactly the same degree. Dug pupæ, too, I imagine, will serve the same purpose as bred ones, for I find, of those of which I dig any number, that the sexes about equal each other. I have noticed this year nine species, of which I have had more than one specimen (of some a great many). Of these, in six cases, the male emerged first. I shall hope to give, in a month or two, accurate accounts of a number of species.—(*Rev.*) *E. Hallett Todd; Windrush, Burford.*

Prior Appearance of Males or Females of Lepidoptera.—I will only say a few more words on a subject which in my opinion possesses but little interest. I supposed that Mr. Greene's remarks were intended to apply to the whole of the Lepidoptera, as no exception was made with regard to the butterflies. I still adhere to the opinion which I have long held, that, as a general rule, the males of all the Lepidoptera appear first, and are more numerous than the females. If the sexes were about equal in numbers, it is not probable that a single virgin female, *Saturnia Carpini*, for instance, would attract from fifty to a hundred males in one afternoon. What I said about the evidence afforded by insects in captivity being of little or no value, of course referred only to the appearance of the sexes: I did not say that captivity had any effect upon them afterwards. Last summer I reared a large number of larvæ of *Hadena thalassina* from the eggs of a single female: they were all full-fed about the same time, and buried themselves in the earth in the breeding-cage, which has stood ever since, close to a window fronting the north, in a room where a fire is never lighted. The first

moth appeared early in January, and others have continued to make their appearance at intervals ever since. The first ten or eleven were all males, and then females began to appear: up to the present time twenty-seven males and eighteen females have emerged. Although the average temperature of the air in the room differs but little from that of the external atmosphere, yet the pupæ were affected by confinement, as the moths would not have appeared so early in the year, or have continued to emerge for such a length of time, in a state of nature. I am aware that female moths are seldom attracted by a light, but they certainly come to swallow-blossoms and sugar just as readily as the males. I frequently saw, last summer, twenty or thirty females of *Agrotis Segetum* and *A. exclamatoris* at sugar on the trunk of a single tree, and large numbers of female *trilinea*, many of which were quite perfect when all the males were worn and ragged.—*Henry Doubleday; Epping, April 16, 1866.*

Prior Appearance of Male or Female Lepidoptera.—Should not any observations which may be made during the coming summer, for the purpose of determining the prior appearance of male or female Lepidoptera, be confined to such species as may be reared from the egg, or from larvæ which can be proved to be of one brood? Owing to the fact that collected larvæ and pupæ are the part of many different broods which have not all emerged from the egg on the same day, and in many instances have not fed upon the same species of food-plant, I do not think that much dependence can be placed on observations made on them. That there is a great difference in the time of appearance from collected specimens and those bred from the egg, will be seen from the following observations. During last summer I collected numerous chrysalises of *Vanessa Urticæ*, the perfect insects from which continued to emerge at intervals extending over twenty days. I also found, on a nettle, a brood of the same insect which had just come out from the egg. These all entered the pupa state within a few hours of each other, and in forty-eight hours from the time of the appearance of the first imago the whole were out. The same results followed a brood of *V. Io*, nearly a hundred of which species were out in the breeding-cage at one time, but the collected chrysalises gave up their perfect insects at various times.

The prior appearance of male or female was not noticed, but it is evident that the sexes of these two species emerge at the same time. I am satisfied that there is yet very much to be learned of the habits and economy of our Lepidoptera, and that these can be accurately studied by rearing from the egg in confinement, especially if the feeding be carried on in large airy cases out-of-doors; and I also feel confident that this fact will be elucidated, that most species have a time and manner of emergence peculiar to themselves, which artificial rearing, if properly conducted, will not materially affect.—*H. Moncreaff; Southsea, April 19, 1866.*

Macroglossa Stellatarum in March.—A pair of this insect were seen by a relative, on the wing, in his garden at Budleigh-Salterton, near Exeter, on the 7th instant, sipping from the blooms of violets and crocuses, but giving a marked preference for the latter flowers.—*William Thomson; 1, Devonshire Terrace, Forest Hill, S.E., March 26, 1866.*

Chærocampa Celerio near Sheffield.—Last October I captured a very fine specimen of *Chærocampa Celerio* in the nurseries at Handsworth.—*W. Frost; Richmond, near Sheffield, January 23, 1866.*

Chærocampa Celerio at Ryde.—This insect has been taken at light by one person at Ryde, and bred by another; the latter came out on the 28th of December. The gentleman who bred *Celerio* was lucky enough to secure a brood of the larva on a vine, I believe at Worthing.—*Jas. Ingram; School House, Nettlestone, Ryde, Isle of Wight, Feb. 1866.*

Sterrha Sacraria near Ryde.—A variety of *Sterrha Sacraria*, having a pink costal stripe in addition to the oblique stripes, has been taken at St. Helen's.—*Id.*

Northern Range of Chærocampa Elpenor and C. Porcellus.—In answer to your correspondent Mr. F. Wilkinson (*Entom.* iii. 57), I may state that both these species appear to occur pretty regularly as far north as Edinburgh, but *Chærocampa Porcellus* would seem to have a more extended range northwards than *C. Elpenor*.—*H. Jenner-Fust; Hill Court, Berkeley, Gloucestershire, April 4, 1866.*

Hepialus Humuli.—In reply to Mr. Müller's inquiry (*Entom.* iii. 58), I have frequently taken *H. Humuli* in the West of Ireland (Kerry and Galway), but have not observed any variation from the ordinary British type, either in the

male or female. Specimens in my collection, taken near Galway, are not distinguishable from others taken in this neighbourhood, except by the tickets. — *Edwin Birchall; Bradford, April 2, 1866.*

Mould on Lepidoptera.—Your correspondent Mr. Wilkinson (Entom. iii. 59) need not fear that benzine will increase any tendency his insects may have to become mouldy; on the contrary, it is generally a good preventive, and, mixed with carbolic acid, now so much in vogue for the rinderpest, will entirely extirpate it. The proportions I use are one of carbolic acid to ten of benzine, and I find that Coleoptera touched with this come quite safe through any trials I have yet subjected them to. The best way of removing mould from the wings is to dry the insect thoroughly before the fire, and brush it off with a camel's-hair brush. From the antennæ it can be removed by the above application, which might with advantage be applied to the under surface of the body. A slightly stronger solution, brushed over the corners of the drawer and the glass frames, would probably check any further development of mould, as also of mites. — *G. R. Crotch; University Library, Cambridge.*

Persian Lepidoptera.—As regards the Persian Lepidoptera (Entom. ii. 230, 231), you are quite right in your surmise that I had selected British or reputed British species. I find I had omitted *Vanessa Polychloros* from the list; it occurs in the Forests of Mazanderan (the ancient Hyrcania), and is by no means common: this will complete the list. I have merely noted those Heterocera that I could identify, not having a single book to refer to at the time. I took above seventy species of Diurna, Pieridæ being in a large majority, and Thecla nearly unrepresented: these were all captured in two valleys of the Elburg Mountains, close to each other. The number of species of diurnal Lepidoptera is not great for the size of the country, Persia, south of the Elburg, being stony and barren in the extreme. I came to India *viâ* Shiraz and the Persian Gulf, and noticed that on crossing a range of hills a few miles north of the ruins of Persepolis, subtropical forms (such as *Danaïs*) replaced *Pieris* in a great measure. One specimen of *Chrysophanus dispar* I took at an altitude of over 9000 feet. The list refers, of course, to North Persia. As for the insects of the "Garmseer," or hot

low country, on the Persian Gulf, I don't believe they comprise anything besides wasps and mosquitoes. As regards British species in this part of the world, *P. Brassicæ*, *Rapæ*, *Napi*, *C. Edusa*, *C. Hyale* (I have grounds for suspecting this latter to have *two* female forms), are all that are on the wing now. During the past season I captured, *inter alia*, *P. Machaon*, *P. Daplidice*, *C. Cardui*, *V. Atalanta*, *V. Urticæ*, *V. C-Album*, *A. Paphia*, *A. Lathonia*, *L. Megæra*, *P. Argiolus*, *C. Phlæas en masse*. *S. Convolvuli*, *C. Celerio* (I have sixteen fine specimens in my collection, and have given away as many more), *C. Elpenor*, *C. Porcellus*, are common; *C. Nerii* is not uncommon, the oleander growing in profusion in river-beds. In another two months that torment *P. Gamma* will be round the petunias of an evening by the hundred. I have collected thirty odd species of Sphinges, all taken on the wing at marvel of Peru, jasmine or petunia flowers: the larvæ I have met with but twice, once some thirty or forty of a non-British *Chærocampa* on a species of water *Ranunculus*; I came across them while up to my knees in water, snipe-shooting, and again a solitary individual of some *Sphinx* on a wild sloe. — *Arthur Young; Assistant Conservator of Forests, Madhopoor, Punjab, February 10, 1866.*

Lepidoptera observed near Dumfries. — In the 'Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society' for Session '63—64, which I have just received, there is a paper by Mr. W. Lennon on "Rare Lepidoptera observed in the Vicinity of Dumfries." Perhaps the list may interest the readers of the 'Entomologist.' *Thecla Quercus*: Comlorgan Wood and Dalscairth (the former is an ancestral possession of Lord Mansfield's, about ten miles south of Dumfries, near the coast, the latter on the slope of the wooded hills—rich in mosses, *Hepaticæ* and ferns—that bound to the west the valley in which the town is situated, the "happy valley" the natives term it). Mr. Lennon has found, on inquiry of several of the Cumberland and Westmoreland entomologists, that *Quercus* has not been seen in either of these neighbouring counties. *Notodonta dictæa* and *N. dictæoides*: grounds of the Crichton Institution, close to the town. *Tephrosia crepuscularia*: Dalscairth. *Geometra papilionaria*: near Donievale and Timwald Downs. *Venusia cambricaria*: Dalscairth. *Scotosia undulata*: Tim-

wald Downs and Dalscairth. *Cilix spinula*: Dalscone. *Melanippe hastata*: Tinwald Downs, Dalscairth, and Lochar Moss. *Carsia imbutata*: Tinwald Downs. — *Peter Gray*; 52, *Packington Street, London, April 11, 1866.*

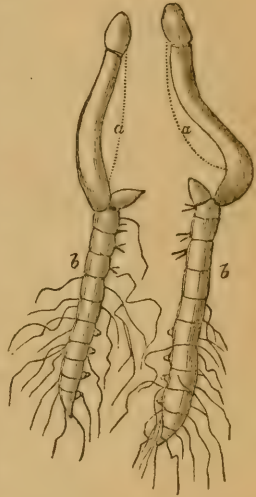
Captures at Sallows.—On the 13th instant, as the moon did not make its appearance, the evening being mild and the wind from the south-west, I thought it a good time to visit the sallows, which I did, and it quite realised my expectations, for the moths were out, I may truly say, in hundreds; I only boxed, however, the following *Tæniocampas*:—Six *gothica*, three *rubricosa*, three *stabilis*, two *gracilis*, twenty-four *miniosa*, six *munda*, seven *cruda* (with the exception of *rubricosa*, I might have boxed any number of the above). Two *Hoporina croceago*, two *Xylina petrificata*, two *Cerastis Vaccinii*, two *C. spadicea*, one *X. lithorhiza*, two *P. meticulosa*, three *Eupithecia abbreviata*, one *L. lobulata*, and two *Pterophorus* which I cannot identify. — *George C. Bignell*; 8, *Clarence Place, East Stonehouse, Devon.*

Query, Larva or Mouse?—The now leafless shoots of the bushes of *Euonymus Europæus*, in the lane leading from Chigwell to the Chigwell-Lane Station of the Great Eastern Railway, are presenting a peculiar appearance, in consequence of the external bark of the *upper* side of nearly every shoot being more or less denuded. The inner bark, thus exposed, quickly blanches, and exhibits a silvery gloss; and this decortication has proceeded to such an extent that few can pass through the lane without remarking the silvery character of the shoots. I send you a piece: can you name the denuder?—*William Thomson*; 1, *Devonshire Terrace, Forest Hill, S.E., March 26, 1866.*

[I have referred these specimens to my friend Mr. Doubleday, who suggests that the decortication of the twigs is the work of a mouse; and on carefully examining the denuded portions of the twigs after this suggestion, I entirely concur with my friend's view: the waved outline of each denuded portion, forming a series of semicircles, is exactly what the gnawing of a mouse might be expected to produce.—*Edward Newman.*]

Larvæ producing Fungi.—I am indebted to Mr. J. W. Whitaker, of Henlow, near Biggleswade, for some Lepidopterous larvæ (*b b*) which I believe to be those of *Hepialus*

lupulinus, and which were found in a heap of wet clay, amongst the underground rhizomes or stolons of the common coltsfoot (*Tussilago farfara*), in all probability their food-plant. These larvæ are all dead, and are remarkable as forming the pabulum of a fungus, probably a *Sphæria*, which completely occupies the whole interior, and sends out its mycelia in all directions through the skin, especially at the spiracles; but in addition to this fungoid substance in the interior, and fibrous mycelia, I find in some specimens, amounting in all to less than a seventh of the series before me, that a stout capitate column (*a a*) rises from the neck of the larva immediately behind the head; this is very evidently the fructification of the fungus. I had the pleasure of demonstrating, some thirty years ago, that the mycelium of *Agaricus Georgii*, one of the Fungi that produce the familiar fairy rings, is in reality the subterranean plant, which radiates in all directions from a central point, producing flowers or fruit only at the extremities of the branches; these flowers are all that we see above ground: a continuous crop is produced throughout the summer, and as their brief existence terminates they decay on the surface of the ground, enriching the soil, and producing those circles of vivid green which appear so unaccountable to the rustic. The same theory of growth is exemplified in the common mushroom and all its allies, but the *geometric regularity* of growth is not apparent. The occurrence of Fungi on dead larvæ is by no means new to entomologists; examples have been exhibited from Tasmania, Australia, New Zealand and China. In the printed 'Proceedings of the Entomological Society of London' many records of these fungoid growths occur, and readers of the 'Entomologist' who have the opportunity cannot fail to be interested in perusing these. See Proc. Ent. Soc. of Lond. 1834, p. xviii.; 1836, pp. vi., xxiii.; 1838, p. iv.; 1839, p.



xxxiv.; 1841, p. xxii.; 1842, p. lxvii.; 1852, p. xxi.; 1857, p. xcvi.; 1863, p. clxxii.; 1864, p. xlv.; 1865, p. lxxxix.; and 1866, p. viii.—*Edward Newman.*

Bembex olivacea found near Gloucester.—At the Meeting of the Entomological Society held on the 2nd of April, Mr. Smith said that, in Stephens' 'Catalogue of British Insects,' the genus *Bembex* was included on the authority of Donovan, who had figured *B. octopunctata* as British, but without assigning any precise locality. In the 'Entomologist's Annual' for 1866, p. 122, he (Mr. Smith) had expressed a hope that this, amongst other genera now expunged from our list, might be re-discovered: he had the pleasure of exhibiting a specimen of *Bembex olivacea* (which name was a synonym of, but had priority over, *B. octopunctata*) placed in his hands by a gentleman at Bristol, to whom it was given many years ago by a Dr. Hicks, who said that he had himself captured the insect near Gloucester.

Correction of Name.—The *Necrobia* you sent me (as noticed Entom. ii. 345) I have submitted to Mr. Bold, of Newcastle, and he returns them as *Necrobia rufipes*, sending me a pair of the true *N. violacea*, in which the legs are an obscure deep blue, with a coarse punctuation on the thorax and elytra. In *N. rufipes* (your insect) the legs are entirely red, and the thorax and elytra more finely punctured.—*J. K. Taylor, Thorn Cottage, Lime Grove, Longsight, Manchester, in a Letter to W. West.*

Working-men's Industrial Exhibition at Guildhall.—Now that this most interesting Exhibition has closed, it may be interesting to preserve a record that one of the Classes contained collections of British Insects actually made and arranged by the exhibitors. The adjudicator selected by the exhibitors, in this and several other Classes, was the Editor of the 'Entomologist,' and the prize medal for Insects was given to James Bryant. The medals were distributed on the 17th of April, by that great benefactor to the poor of London, George Peabody, the Lord Mayor occupying the chair.

Errata.—In No. 27 of the 'Entomologist,' at page 54, line 22, for "11 a.m. to 2 p.m." read "11 p.m. to 2 a.m." At page 57, in the second column of Mr. Birchall's list, for "19" read "18."

THE ENTOMOLOGIST.

No. 29.]

JUNE, MDCCCLXVI.

[PRICE 6D.

Rediscovered or new British Coleoptera: Nemosoma elongatum, Hydroporus neglectus, Helophorus nanus, Phytobius 4-nodosus, Ilybius subæneus, &c. By JOHN A. POWER, M.D.

I HAVE recently had the pleasure of rediscovering two very rare insects, which had, as it were, vanished for between thirty and forty years, so that I imagine few British Entomologists have seen them alive.

The first is *Nemosoma elongatum*. It was taken in considerable abundance by Messrs. Ingall and Westwood, in an old elm-rail near Sydenham, about the year 1830. In the year 1833 Mr. Ingall gave me sundry specimens, and from his stock the insect has got distributed on points, or pinned through all the old collections, but has always been considered rare. Since this time I only know of three specimens being taken, one by myself at Sydenham, whilst *actually talking of the insect*, and two by my friend Mr. De Rivaz. I may safely say that for the last twelve years I have seldom observed an elm-rail without thinking of *Nemosoma*.

Last Easter I was on a visit to an old College friend, the Rev. Jas. Gorle, of Whatcote, near Shipston-on-Stour; and on Easter Monday we had a fishing expedition to a glorious old place about two miles distant, Compton Wynyat, belonging to the Marquis of Northampton. The house is a grand example of the style of about Henry VII.: there are fish-stews, moats, &c., peacocks both alive and clipped out of yew and box-bushes, &c. The house, one of the *notabilia* of Warwickshire, is kept in good condition by the Marquis, who occasionally retires, like a sensible man, to the quiet of this sequestered spot. Whilst my friend Gorle, with his sons and daughters, were fishing, without much success, in an east wind, "good neither for man nor beast," though we have sometimes caught some grand perch, &c., at this place, I was hunting about after my favourite Coleoptera.

Around a tench-preserve I found a series of beetle-eaten ash and elm rails, which I forthwith attacked, and soon found a profusion of an insect by no means common, *Hylesinus vittatus*, affecting indifferently ash and elm: there were abundance of both perfect insects and larvæ. On breaking up the bark I at last found an elytron of *Nemosoma*. I observed that it was in a piece of *elm*-bark; and on persevering in my hunt I was soon rewarded by getting the perfect insect. I then spent an hour or two in investigating its history. I very soon found the larva, a reddish active creature, with a thoroughly Coleopterous horny head. On peeling off sheets of the bark I saw a large number of these larvæ, and found comparatively few (some twenty) of the perfect insect, manifestly in a state of hybernation; for, although I cut out with the greatest care only those which were exposed, I found some four or five of them with imperfect tarsi and antennæ, and the stump discoloured and as it were cicatrized, proving clearly that the injury was an old one.

This insect is said to be parasitic upon the *Hylesinus vittatus*, just as *Collydium elongatum* is upon *Platypus cylindrus*, and I think that this is very probable; for the whole bark was literally alive with the *Hylesinus vittatus* and its larva; but every specimen of the *Nemosoma* which I found, had burrowed transversely across the bark, so as to come into continual contact with the larvæ of *Hylesinus* and their excretion. These larvæ were all burrowing longitudinally. On removing the bark I exposed I may say hundreds of these larvæ, and, having an idea that I might be able to breed them, I ceased breaking up the flakes, and packed them face to face, and so brought them home. I found that in transferring them *no larvæ had fallen out*, whilst all those which I had seen had disappeared, and were no doubt pursuing their usual course in the substance of the bark or the burrows of the *Hylesinus*; and I fully expect that there are many more than what I saw, and that I shall be able to breed out, in May or June, a considerable supply of this rare creature; for the bark still remains in a first-rate condition, and I brought home an abundant supply of it.

At Whatcote, in a pit in one of the glebe-fields, I also took a considerable number of specimens of an Hemipterous insect, *Corixa præusta*, and a few of *C. limitata*, neither of

them as yet recorded as British, but which will soon, no doubt, be brought into notice by Messrs. Scott and Douglas. I had previously taken *C. præusta* at Cowly; and Messrs. Douglas and Scott, as well as myself, have subsequently taken it, as well as other rare ones, at Lee.

The second insect is *Helophorus nanus*, *Sturm.* The only notice I find of this creature is in Stephens' 'Manual,' as rare near London. I believe that the last time it was taken was by myself, in Suffolk, in 1833, and I have seen no specimens except those which I have distributed. Within the last fortnight I have again taken it in considerable numbers, in a pit near Blackheath, which has for years been a frequent haunt of mine. It is most singular and most unintelligible that insects should thus turn up every now and then, and that even in profusion, in localities from which they were apparently previously entirely absent.

I have for many years ceased to search for my old friends, the water-beetles, around London, imagining that nothing fresh was to be obtained; but during the last six months I have entirely changed my mind, and suspect that many new, or at any rate rare, insects are to be had for searching. At Esber I can always now get *Hydroporus celatus*, one of Mr. H. Clark's new species; and in a very limited space near Blackheath I find a species of *Hydroporus* new to Britain, viz., *H. neglectus*, as well as *Ilybius sexdentatus* (recently added to our list) and *Helophorus nanus*. All these I have taken recently. The same district also affords some fine water Hemiptera, including *Corixa præusta* and other species hitherto almost unique, as *Corixa distincta*, *concinna*, &c. Again, Mr. Newman sends me, from the neighbourhood of Peckham, an *Ilybius* which I believe to be *I. subæneus*, *Er.*,—*new to Britain*. It is very nearly allied to *I. fenestratus*, but is darker in colour, more contracted and lumpy in form, and altogether different in appearance. Whilst examining this insect I have observed a sexual character on the under surface of the abdomen, not, I think, hitherto noticed, which will enable us, I fancy, to determine satisfactorily several of the doubtful species of *Ilybius*, &c. In the males we find a series of longitudinal plicæ, very similar to those observed in the males of the *Otiiorhynchi* recently discussed by Messrs. Smith and Rye. In the female we have on the last segment a notch and ridge, upon the relative

development of which I propose to myself, some time or other, to say a few words, and to establish certain diagnoses, as between *Ilybius guttiger* and *angustior*. In the present case, in *I. fenestratus*, we have a mere triangular notch on the under surface of the last abdominal segment, and a ridge extending from this; whereas in *H. subæneus* we have a notch, *but with the margins of it flattened* in the most remarkable manner, and no distinct ridge connected with it. Of British *subæneus* we have as yet but one specimen, a female, and therefore the comparison is not decidedly satisfactory. I trust that more specimens will be obtained by our friend Mr. Newman and his neighbours.

At Lee I have also myself found a species of *Pachyrhinus* (*Phytobius*) not yet described as British. We have in our catalogues *Pachyrhinus 4-nodosus*. Now I found at Lee some six specimens of a species living only in marsh-ground, larger, more coarsely tuberculated, and with shorter thorax than one which I find at Mickleham, Reigate, &c., on dry and chalky places. The latter is no doubt the *Pachyrhinus 4-nodosus* of Waterhouse's 'Catalogue.' Mr. Crotch, at my request, took *both* species over to Paris, and M. Brisout de Barneville returned the Lee specimens as *Phytobius 4-nodosus*, and the Reigate and Mickleham specimens as *Phytobius denticollis*. We have therefore, at any rate, a *new* species, which, as far as I can judge, must take the name already existing in our catalogues; whilst the old one must take a new name, viz., *P. denticollis*.

JOHN A. POWER.

52, Burton Crescent,
April, 24, 1866.

Description of the Larva of Chelonia Plantaginis. — The egg is laid in June, on the under side of the leaf of *Plantago major* (broadleaved plantain), on which plant the larva feeds: by the end of August it has attained a length of from half to three-quarters of an inch, and may then be found on the under side of the leaf, its presence being indicated by a nearly circular hole in the disk, or a notch on the margin of the leaf: when touched it falls from its food-plant, feigns

death, and rolls itself in a ring ; but soon unrolls, and begins to crawl with considerable rapidity : it hybernates early in September, and feeds again in the spring, being generally full-grown by the 1st of May. Head slightly narrower than the 2nd segment ; body with the segments well marked, and each having a transverse series of twelve warts, from each of which issues a dense fascicle of long bristles. Colour of the head, body, legs and claspers black ; bristles also black, except on the dorsal surface of the 5th, 6th and 7th segments, where they are red-brown, forming a conspicuous brown patch : when full-fed it spins a loose cocoon among the plaitain-leaves or blades of grass, and changes to a dark-coloured glabrous pupa, the moth making its appearance in June. I am indebted to Mr. Brown, of Cambridge, for a supply of these larvæ.—*Edward Newman.*

Description of the Larva of Pericallia syringaria.—The eggs are laid in July and August, on the twigs or leaves of *Syringa vulgaris* (garden lilac) or *Ligustrum vulgare* (privet) ; the young larvæ emerge in August, and by the middle of September, when they usually cease feeding for the winter, have attained a length of three-quarters of an inch : they then invariably rest on the margin of a leaf in an arched posture, the ventral surface of the 4th and 5th segments being brought into contact with the ventral surface of the 8th and 9th segments, the two extremities forming no portion of the arch, but being extended on the margin of the leaf, the claspers, but not the legs, being firmly attached : when annoyed it rocks itself to and fro, the posterior segments, anchored as it were by the ventral claspers, alone remaining stationary ; the rocking or oscillating motion is also observable when the larva is crawling. The head is prone, rather wider than the 2nd segment ; the face flattish and the crown slightly notched : the surface of the body is singularly uneven, being both humped and indented, and emitting a number of hairs and bristles ; the principal humps are three dorsal pairs transversely seated on the 6th, 7th and 8th segments respectively ; the pair on the 8th segment are the longest, and the most approximate at the base ; towards the apex they separate, being slightly curved outwards and backwards ; those on the 7th segment are the shortest, and most distant at the base ; on each side of the body, exterior to the

humps, but still almost on the dorsal surface, is a series of three minute warts, the first equidistant between the first and second pair of humps, the second equidistant between the second and third pair, and the third at a like distance behind the third pair; every part of the larva is clothed more or less abundantly with hairs. Colour rich brown, with the exception of the three dorsal warts, which are white. In this state these larvæ generally hibernate, feeding again in the ensuing spring, and then assuming a much more variegated appearance: the dorsal surface, as far as and including the first pair of humps, becomes orange-red; the last pair of humps is also orange at the tips; and there are orange markings on the sides of the 7th, 8th, 9th and 10th segments; the rest of the surface is shaded with rosy gray and brown, having a whitish stripe on each side in front, and the lateral warts also white. When full-fed it spins a slight net-like cocoon on the under side of a leaf, and in this changes to an obese, short, shining brown pupa, adorned with darker stripes and spots. For a supply of the larvæ of this species I am indebted to Col. Stewart, who informed me that one specimen spun up and turned to a pupa during the month of September, doubtless preparatory to passing the winter in the pupa state. The moth appears in July. — *Edward Newman.*

Description of the Larva of Camptogramma bilineata. — Rests in a nearly straight position, but with the anterior extremity slightly raised: when annoyed the head is tucked in, and bent under the anterior part of the body, and, if the annoyance continues, the ring or volute thus formed is tightened and intensified, until the ventral claspers are lifted from the leaf, and the larva, having assumed the form of a perfectly compact ring, suspends itself by the anal claspers only. Head slightly narrower than the body, prone, subrotund, having several bristles scattered over its surface: body rather obtuse, transversely deeply wrinkled, the skin forming very conspicuous folds; at the junction of the segments there is also a manifest skinfold along the sides; on every segment is a transverse series of small warts, and every wart emits a bristle. Colour of the head pale subdiaphanous apple-green, reticulated with pale brown: body apple-green, inclining to yellow-green on the back, variously mottled and reticulated

with whitish green; lateral skinfold white-green; on the ventral surface the white-green markings are ranged into indistinct longitudinal series: spiracles brown, the anterior pair very prominent and conspicuous; legs very pale green and pellucid, almost colourless; ventral claspers bright apple-green; anal claspers concolorous with the body; all the bristles brown. Feeds on many herbaceous plants; the specimen described, for which I am indebted to Mr. Doubleday, was found on the cultivated strawberry, and ceased feeding on the 4th of May.—*Edward Newman.*

Description of the Larva of Thera obeliscata.—Rests in a nearly straight position, lying along one of the needles of *Pinus sylvestris* (Scotch fir), on which it feeds, its claspers being always attached, but its legs free: it will not roll the anterior part of the body into a volute, nor will it fall from its food-plant on being annoyed. Head exerted, of slightly less circumference than the body, and having scarcely any indication of a notch on the crown, prone, the mouth being tucked under and brought into close proximity with the legs: body of uniform thickness throughout, and having a lateral skinfold, otherwise uniformly cylindrical and quite smooth; the 13th segment terminates beneath the anal flap, in two short points directed backwards. Colour of the head pale opaque green; of the body dull green, with three white dorsal stripes, each of which is somewhat double, that is, it has a narrow darker median stripe vaguely defined: of the three double stripes the middle one is less distinct and less conspicuous than the others: on the lower or ventral margin of the lateral skinfold is a narrow but clearly defined white stripe, and there is also a narrow but clearly defined medio-ventral white stripe: the legs and mouth are pink; the claspers green. I am indebted to Mr. Thomas Hockett for a liberal supply of these larvæ, which were full-fed on the 6th of May, 1863, but the publication of the description has been deferred from my uncertainty about the name: on the 5th of May, 1866, I received two other full-fed larvæ from my kind friend Mr. Doubleday, accompanied by the note which immediately follows. I ought to add that Guenée (x. 373) considers the *obeliscata* of Hubner (II. 296; Dupouchel, v. 515, pl. 206, fig. 8) to be a mere variety of *Thera variata*; I entirely agree with Mr. Doubleday in dissenting from this opinion.—*Edward Newman.*

Thera obeliscata of Hubner.—I send you two larvæ of our Thera, which I think is really distinct from the variata of Hubner, although I believe all modern Entomologists are of a contrary opinion: Dr. Staudinger has sent me what he considers intermediate varieties, but they do not seem so to me: the true Thera variata is of an olive or greenish brown, with a strongly dentated central fascia; ours is always either of a rufous or blackish tint, and the central fascia is scarcely at all dentated. Hubner has figured the larva of variata with a red head, and with the white stripes of the body continued through the head; the larva of ours has a plain dull green head, and the white stripes commence on the 2nd segment, that is, immediately behind the head.—*Henry Doubleday; Epping, May 4, 1866.*

Entomological Notes and Captures.

The Bite of the Water Spider (Argynoreta aquatica).—A specimen of this insect was taken by me in a ditch in the Hackney marshes, where it is abundant, and confined in a bottle in which I placed a sprig of Callitriche. The next morning I had the pleasure of seeing the curious subaqueous air-bubble which the insect had constructed, so that I had no doubt as to the character of my capture. Removing it from the water rather carelessly, the insect bit me. This was quite unexpected, and I threw it down, being more under the influence of nervous apprehension than pain. I took it up a second and a third time, and received two more bites for my trouble. The sensations were at the time only momentarily disagreeable, but not to be called painful. The fang of the insect entered the nail of my fore-finger, producing a deadened sensation of the bite, and leaving a very perceptible puncture, which is still visible on the surface, although it is now nearly a fortnight ago. About half-an-hour after I became conscious of another bitten locality. The under surface of my fourth finger had evidently received the poison. Near the first joint from the nail there was a minute red point, barely perceptible to the eye, but well-defined and unmistakable when examined with a pocket-lens, no swelling, but a slight soreness on pressure, the sensation continuous, resembling exactly the

sting of a nettle, and lasting for eighteen hours. Repeated applications of water had not the slightest effect; a few drops of strong liquid ammonia removed the pain, but the sensation returned as the ammonia evaporated. The pain was so feeble that I was unconscious of it when conversing with my friends, and only sensible of its existence when my thoughts were not occupied with something else. It continued nearly the same throughout the eighteen hours, and went away suddenly in about ten minutes. My experience of the bite of this insect has been such as to induce me to handle it carefully, as I am by no means anxious for a renewal of sensations which, although at first momentary and not decidedly painful, are afterwards prolonged and therefore unpleasant. — *Harland Coultas*; 69, *Shrubland Road, Dalston, May 1, 1866.*

Prior Appearance of Male or Female Lepidoptera. — Like Mr. Doubleday, I think "this subject possesses little interest," at all events for old breeders, whatever interest it may possess for those who do not remember the matter being settled to the satisfaction of said old breeders long ago, or to jaunty writers who are "zealous as new converts," and in haste to prove people mean more or less than they say. For anyone to collect a lot of larvæ full-fed, as in the case of *Lithosia caniola*, and base an argument upon the appearance of one or the other sex therefrom, is self-evident folly, because I do not remember anyone ever saying all one sex appeared before the first specimen of its mates put in an appearance; and as our friends do not pretend to have captured every *caniola* larva on Howth or elsewhere, how are they to settle prior appearance from a promiscuous lot, it may be parts of many broods, it may also be of many ages? When Mr. Edleston says, "Mr. Doubleday's assertion, that the males commence flying when the females come out of the pupæ, is not correct," he is himself in error. I did not understand Mr. Doubleday to mean the males sat still until the moment of female emergence, neither has anyone with whom I have conversed on the subject, or that the females were not stretched when the males deserted them; but even Mr. Edleston, with his great experience amongst the long list of common species (*Entom.* iii. 68), seems to require to see other species *in cop.*, whilst yet the female is undeveloped or quite limp; and if he will watch a brood of the common *Hepialus*

lupulinus as they are appearing, he may see something new to him, but certainly not implied in Mr. Doubleday's note. Again, taking common species known to everybody, I have seen *Bombyx Rubi* *in cop.*, whilst yet unstretched, at 9 p.m., and by 10 o'clock she was perfect; and I have seen *Arctia fuliginosa*, *in cop.* at 5 p.m., unstretched at 7. The eggs deposited were bred to imagos in less than forty days, *all* females, by Mr. Edmondson, to whom I gave the eggs; at 9 *in cop.* again (these eggs I gave to Mr. A. Cooke): they fed up, and appeared two months after Mr. Edmondson's. Next morning, when I took this lot of eggs out, the pair were *in cop.* a third time: I fed this lot of larvæ myself, and they lived through the winter, made up in April, and appeared in May. This is a well-known fact. Why, then, should we dogmatize, especially when I say *all* my larvæ produced males? When more specific attention is paid to each species,—when the eggs and larvæ are figured, the habits both of larvæ and imagos described carefully in our books, and the errors in our old ones corrected,—we may then hope to draw deductions which will lead to correct ideas on our favourite study; but in the meantime I think we may “rest and be thankful” that the male, as a general rule, is out and ready to wait upon his mistress, I will not say the moment she appears, but I will say the moment she “calls” him.—*C. S. Gregson; Rose Bank, Fletcher Grove, Stanley, Liverpool, May, 1866.*

Prior Appearance of Male or Female, &c.—*Ennomos illustraria* has appeared this season as follows:—April 7th, one female; 8th, one male; 12th, two males; 14th, two males, one female; 20th, three females; 26th, one female; 30th, two females. The female which appeared on the 7th of April spun its cocoon on the side of a cage which was kept in-doors throughout the winter; but the other pupæ were placed in a large cage, with a perforated zinc top, which stands in our garden, exposed to the influence of the weather. They are all bred from larvæ taken in the forest at Loughton, at the end of September and beginning of October last year.—*William Machin; 22, Argyle Road, Carlton Square, Mile End, May 14, 1866.*

Prior Appearance of Male or Female, &c.—On the 14th of April I went, accompanied by a friend, to beat the sallows. We took sixty-two *Tæniocampa opima*, and not a female

amongst them. We went again on the 21st; the night was not favourable, and we only took five of the above species, but two of them were females.—*Wm. Johnson*; 26, *Brenton Street, Park Road, Liverpool*.

Prior Appearance of Male or Female, &c.—I first saw *Adela cuprella* this year on Wimbledon Common, on the 20th of April; it had then probably been out two or three days, judging from the number seen; all were males, and in excellent condition. On the 25th I took two females, quite fresh, and saw two others: the males were more abundant than on the 20th; I could have captured fifty or more easily; nearly all I netted were somewhat worn. On the 26th I took four females, quite fresh, and saw two or three more: males as on the 25th. I could not go the next day, and on the 28th the weather became wet and cold; and by the 4th of May, when a favourable change took place, *A. cuprella* had nearly disappeared; I saw only one, a female, and not another after that day. The males are certainly more active than the females, though the latter have the same habits, flying round the willow-blossoms during sunshine; they do not fly so vigorously, or keep on the wing so long without settling; their fuscous heads, shorter antennæ, and yellower tint make them strikingly distinct from the males even when flying. I may mention, as a caution to collectors, that while looking for the insects I saw and killed a rather fine adder. *N. C. Tuely*; *Wandsworth, May 10, 1866*.

Nyssia hispidaria.—During the month of March I was fortunate enough to take males and females of *N. hispidaria*; I also obtained eggs on the 21st of April. The young larvæ soon began to emerge; they are now feeding readily both on elm and oak; I think the latter is their proper food, as there is scarcely anything else in the locality where I took the insect.—*James Batty*; 5, *Court Hollis Croft, Sheffield, April 28, 1866*.

Notodonta carmelita at *West Wickham*.—On the 27th inst. I had the pleasure of taking a fine female specimen of this rare insect off the Bishop's Fence; it had only just emerged from the pupa, as the wings were not dry. I took it exactly at 8 A.M.—*William Watkins*; 414, *Oxford Street, London, April 30, 1866*.

Blight on Cinerarias.—I am puzzled every season, and it

has been particularly the case this year, to account for the appearance of the leaves of the Cinerarias just before they come into bloom and while they are in bloom; the leaves turn flabby and hang down, but I find no Aphides on them. The usual appliances of tobacco-smoke and Gishurst's compound have been made without good effect.—*James Wallis; Leeds, May 15, 1866.*

Leaf-miner of the Violet.—Three leaves out of every ten of the violet (*Viola odorata*) are blotched and bladdered by a small grub which feeds between the two cuticles: the appearance is that of ochre-coloured snow showered over the leaves. What is the insect, and what the remedy? By a little information you will oblige—*A Subscriber from the beginning.*

[The same insect has attacked my own violets, and I have sent a dozen leaves to Mr. Stainton, who thinks the insect dipterous.—*Edward Newman.*]

Blight of the Fuchsia.—I am excessively plagued, even at this early period of the year, with an insect which attacks the under side of the leaves of the Fuchsia, which are only just now expanding: there are one or more specimens on each of the shoots I send. They are not the common plant-lice or Aphides, but a good deal resemble them: wherever there is an insect the leaf is crumpled and distorted. It is curious that all the plants infested are those which have flowers with white sepals; those having crimson sepals remain healthy.—*J. S. Bourne; Bristol, April 30, 1866.*

[The infesting insect is the larva, or in some instances the egg only, of *Aphrophora spumaria*, the creature which produces the familiar but very objectionable cuckoo-spittle: it is singular that in several instances the crumpling of the leaf occurs where the egg only is visible: how this affects the ordinary circulation or sap I am unable to explain.—*Edward Newman.*]

Thecla Quercus in Cumberland and Westmoreland.—Mr. Peter Gray states (*Entom.* iii. 73), on the authority of Mr. Lennon, that *Thecla Quercus* is not found in either Cumberland or Westmoreland: the following records will be sufficient, I think, to establish its occurrence in at all events the former county:—Lake district (Stainton's 'Manual'); Carlisle (Mr. Cartmel, in the 'Substitute'); Cumberland (Mr. Arm-

strong, 'Intelligencer,' vol. vii., and Mr. Hodgkinson in the same volume); Mr. Mawson also includes it in a list of captures in Cumberland. — *H. Jenner-Fust, jun. ; Hill Court, Berkeley, Gloucestershire, May 5, 1866.*

Note on certain Insects found in the Stomach of the Herring Gull.—On the 19th of this month I killed some herring gulls, for the sake of the viscera and other dissecting purposes. On opening one, a young male of last year, dead, to all appearance, for about an hour, I found and saw the heart still beating with the accustomed pulsations. Knowing that the bird could not feel, for the shot had passed through the brain, I removed, in a state of life, all the internal organs but the lungs and the heart, the latter still beating, and continuing to beat till the pulse sunk gradually from excess of hæmorrhage. I have always found the gull a bird most tenacious of life, flying in many cases long distances when wounded, even in the heart and head, with No. 2 shot. In the gizzard I found only a quantity of larvæ, pupæ and a few imagos of the sand-fly, together with some shells, a smaller pupa, and a creamy substance, some of which I send you. I have met with these insects frequently in the stomach of this bird, yet I never believed that they picked up these minute creatures as food, as I have been told they must do by professors of Ornithology, who, to strengthen their remarks, always informed me that the gulls ate worms, a fact I well knew; but I maintained, and maintain still, that whenever these grubs are found in the stomach of this gull, they have been swallowed by accident with a piece of putrid substance washed from the shore by a storm or a higher tide than usual; and if you look at the minute size of some of the pupæ (smaller than canary-seed) I think you will agree that my supposition is correct, and that the gull does not of choice eat such minute food. I never found these substances in a gull except during the easterly gales, the rubbish of the shore being cleared off; and at these times they may be found in the stomach of the largebilled great blackback gull, a bird that would look very curious picking such minute atoms from perhaps a minute piece of decayed animal matter, whilst even the herring gull can bolt two large herrings tied together, as may be seen in my gull-house during the herring season: a shag can swallow six herrings without stopping,

and thirty-six in a day. Now to think that minute larvæ would satisfy the cravings of so large a bird as a herring gull seems to me incredible, and the supposition given above I think the true solution, and that minute larvæ are not the food of this gull. I have been asked how it is that the putrid substances in which the larvæ occur are not always found in the stomach with them. I have always answered that decayed substances are more rapid in their digestion than fresh, the acids of the stomach and the acids in decay causing very rapid evacuations; this I have proved often with gulls: and again, that things with life must first die before the gastric juices can affect them; consequently that these larvæ and pupæ would have to die first and then digest before leaving the stomach, or, in the case of the pupæ, perhaps pass, after a time, entire from the body. Again, the food of the gulls becomes triturated, if I may use the word, to a certain degree, in the crop, before entering the stomach, which process these insects and their food substance must have gone through before even entering the gizzard; the matter in which the insects were, readily submitting to this operation; while the larvæ and pupæ, having life, passed unscathed to the gizzard, from which I took some of the larvæ of the fly alive. It may be interesting to know that the perfect fly in most cases left the pupa in the stomach, the genial warmth bringing it to life and death at the same time, for each fly had a corresponding empty chrysalis-case. — *Harry Blake-Knox*; 2, *Ulverton Place, Dalkey, Co. Dublin, March 23, 1866.*

Silvanus bidentatus near *Paisley*. — I have taken, under pine-bark near Paisley, a single example of a *Silvanus* which Mr. D. Sharp informs me is the *bidentatus* of Fabricius. It is half as large again as *S. unidentatus*, and more elongate and duller than that species, having also the anterior angles of the thorax much more distinctly and sharply spined, and a short but decided spine on each side of the head, behind the eyes. The thorax, moreover, is longer, and has two shallow longitudinal grooves; the joints of the antennæ are longer, and the tibiæ are not dilated externally and obliquely truncated, as in *S. unidentatus*. — *Morris Young*, 7, *Old Sneddon*, in '*Entomologist's Monthly Magazine*,' January, 1866.

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JULY, MDCCCLXVI.

[PRICE 6D.

Description of the Larva of Smerinthus ocellatus.—The eggs are laid singly on the leaves of various species of Salix, and not unfrequently on apple trees in gardens, generally in the month of June, and the young larvæ emerge in about eleven days, and are full-fed in August. The larva rests on a twig of its food-plant, attached by the 2nd, 3rd, 4th and anal claspers, elevating the fore part of its body; the head is prone, and the mouth touches the first pair of legs; all the legs are crowded together and directed forwards, the first pair brought into contact with the mouth: the larva never falls from its food-plant or feigns death, unless its statuesque immobility may be so interpreted; the head is rather long and narrow, the outline of the face conical, the crown pointed but not acute; it is sparingly covered with minute points, giving it a rough feeling to the touch; the body is obese and cylindrical, transversely wrinkled throughout, the wrinkles dividing each segment into eight transverse sections, each of which is beset with raised points, which give the entire surface the appearance and feel of shagreen; the back is straight until the 12th segment, when its outline descends at a right angle to the anal claspers; just at the angle is seated a slightly curved horn, rough or shagreened like the general surface of the skin; there is on each side a very inconspicuous lateral skinfold. The general colour of the larva, both of head and body, varies in different specimens from apple-green to glaucous-green; the former colour is constant in youth, but the latter is not the infallible characteristic of maturity, as I have seen full-fed larvæ of the brightest green colour; the conical outline of the face is accompanied by a very distinct yellow or white line; the ocelli are brown: the body is adorned on each side by one longitudinal and seven oblique white lines; the longitudinal white line is lateral and confined to the 2nd, 3rd and 4th segments; the oblique white lines are also lateral, and, commencing at the lateral

skinfold, pass backwards and upwards just over each spiracle, terminating on the back; the seventh or last of these oblique stripes is the broadest and most conspicuous; it is continued faintly into the dorsal horn, which is otherwise of the most delicate blue, the tip tinged with black; the spiracles are elongate and clear brown, a mere line in the centre being white: the legs are pink, the claspers concolorous with the body, except their prehensile fringes, which are brown. It enters the earth to undergo its change to a pupa, which is accomplished just below the surface, in an earthen cell, but without silk: the pupa is of a rich brown colour and glabrous, the extremity furnished with a short horn covered with scabrous points. The perfect insect appears in June. I find this larva every year feeding on the apple trees in my own garden.—*Edward Newman.*

Life-history of Pæcilocampa Populi. — The eggs are laid in November and December, three or four together, on the bark of *Quercus Robur* (oak) and *Populus nigra* (black poplar); the larvæ have also been found on the Lombardy poplar; the young larvæ emerge during the third and fourth weeks in April, and feed throughout the month of May, acquiring their full size the first week in June, when they are an inch and a half in length, and very beautiful and conspicuous objects. The larva then rests in a perfectly straight position on the trunk of the tree or on a branch, seeming to take especial pleasure in sunning itself in some exposed place. I have often seen and admired them while thus reposing on the trunks of oaks in Birch and Darent Wood, but have never happened to find them on any species of poplar. The head is narrower than the 2nd segment and semiporrect: the body is of nearly uniform width throughout, convex above and flattened beneath: it has on each segment a transverse series of depressed warts; these are rather more conspicuous along the regions of the spiracles, where each emits a radiating fascicle of hairs, which together form a continuous lateral fringe on each side: the entire dorsal surface appears on a cursory glance to emit hairs, but on close inspection these are generally found to emanate from depressed warts. Colour of the face gray, of the crown ochreous, the entire head being delicately reticulated with black: body pearly gray, variegated with ochreous spots, and delicately reticulated through-

out with the most intense black ; these black markings are, however, extremely minute : the ochreous markings, generally occupying the dorsal warts, cause these to assume the appearance of greater elevation than they really possess, an effect considerably enhanced by the more sombre hue of the general surface ; this appearance, however, is deceptive, the warts of the lateral series, which are gray, being in reality slightly more elevated than those of the dorsal series ; the series of dorsal and lateral orange markings may, by a fertile imagination, be converted into stripes ; but thus to describe them would rather tend to mislead than to instruct ; the hairs on the back are generally black, those on the sides pearly gray or white ; ventral surface pale, slightly tinged with ochreous, with a median black line on the 2nd, 3rd, 4th, 5th, 6th, 11th and 12th segments, a roundish medio-ventral black spot on the 7th, 8th, 9th and 10th segments, and a smaller bifid black spot on the 13th : legs ochreous-yellow, with a black spot at the base of each : claspers ochreous. The larva spins a dark brown and tolerably hard cocoon of an oblong form and compact texture : in confinement the cocoon is formed among the leaves, moss, or other matters at the bottom of the breeding-cage, often slightly under the surface of the ground. In this cocoon it becomes an obese brown pupa : the moth appears in November and December. I am indebted to Mr. Gascoyne, of Newark, for a supply of this beautiful larva for description.—*Edward Newman.*

*Description of the Larva of Bombyx Rubi (Fox Moth).—*The egg is laid at the beginning of June, on *Calluna vulgaris* (ling), *Betula glutinosa* and *B. alba* (birch), and various other trees and shrubs ; the larva emerges in fourteen or fifteen days, and feeds on the leaves of the plants mentioned ; it is full-fed in September, and then may be found not uncommonly on heaths and commons, a conspicuous object ; when handled it feigns death, rolling itself in a very compact ring. Head narrower than the 2nd segment, the width of which is increased by a fleshy protuberance on each side of the head ; with this exception the body is uniformly cylindrical, and clothed throughout with downy hairs. The colour until the last change of skin is intense velvety black, with a yellow band on both the anterior and posterior margin of the 2nd and 3rd segments, and on the posterior margin only of

all the rest, except the 12th and 13th; and these bands are rendered peculiarly vivid by contrast with the black ground colour; these yellow bands are dorsal only, scarcely extending half-way down the side; each of them is slightly interrupted in the middle. After the last ecdysis these yellow bands are entirely lost, and the hairs on the back are of a golden brown colour: towards the end of September it spins, among the heather, a very large cocoon, that seems enormously disproportioned to the size of the moth: it is sometimes as much as three inches in length, and composed of a sort of thin felt, in the manufacture of which the hairs of the larva are largely employed; it is of a dark brown colour and semitransparent, so that the enclosed pupa may readily be discerned occupying about a third of the interior; the pupa is dark brown, almost black, and extremely blunt and rounded at both extremities; every part of the pupa is densely clothed with extremely short fine bristles: the moth appears at the end of May or beginning of June. Great difficulty formerly attended the rearing of this moth in confinement, until Mr. Doubleday provided for the larvæ a large open box, having a heathy turf at the bottom, and the top covered with wire gauze. The box was left throughout the winter perfectly exposed to all weathers, and the natural conditions thus fulfilled. I am indebted to Mr. Blackmore for a supply of this larva.—*Edward Newman.*

Description of the Larva of Metrocampa margaritata.—The egg is laid in July, on *Fagus sylvatica* (beech), *Betula alba* (birch), *Cytisus scoparius* (broom), and other trees and shrubs; it hibernates when small, and begins to feed again in May as soon as the leaves of the beech are expanded. When full-fed, which is about the third week in May, it rests in a perfectly straight position, the ventral surface closely appressed to the twigs. Head slightly wider than the 2nd segment, protracted when at rest, the face flat, the crown obtusely bilobed, but without a conspicuous median notch: body of nearly uniform width throughout, convex above, flat beneath; on each side is a manifest but interrupted skinfold, including the spiracles, and beneath this is a fringe composed of filamentous processes of the skin mixed with bristles; this fringe is directed downwards, and appears to embrace the twig on which the larva is resting; the 2nd, 3rd and 4th

segments have each a transverse dorsal series of warts; the following segments, from the 5th to the 11th, both inclusive, have each four warts placed nearly in a quadrangle, but the anterior pair are always nearer together, and also rather smaller than the posterior pair; the 12th segment, like the 2nd, 3rd and 4th, has a transverse series of warts, of which a median pair are conspicuously the largest; every wart emits a bristle from its summit; there is a pair of claspers on the 9th, as well as on the 10th and 13th segments; those on the 9th segment are smaller than the others, and appear retractile, sometimes disappearing as the larva crawls. General colour of the head and body dingy brown, the 7th and 8th segments having each an indication of two dark transverse bands; ventral surface almost white, in some specimens tinged with green. Beaten in Epping Forest on the 13th of May, 1864, when it was full-fed. I have beaten this larva in Birch Wood, &c., about the middle of May.—*E. Newman.*

Description of the Larva of Hemitea thymiaria.—Rests in a perfectly straight position, at an angle of forty-five degrees with the twig, which it clasps with its anal claspers, the head tucked in and the mouth appressed to the legs. Head as wide as the 2nd segment, scabrous, deeply notched on the crown, the lobes being conical and directed forwards: body scabrous, the scabrosity consisting of elevated papillæ which are blunt at the tip; 2nd segment with two dorsal conical protuberances directed forwards, and closely resembling those of the head; this, as well as the 3rd and 4th segments, is extremely uneven and wrinkled. Colour of the head dark brown; prevailing colour of the body the same, but considerably variegated, and having the 7th, 8th and 9th segments suffused with olive-green: the papillæ are brown or white; the white ones form longitudinal series on the 4th and 5th segments, and a V-shaped marking on the 6th and 7th: in some specimens the colours are bright, and the purple-brown and green and white form a beautiful contrast; in others the colours are rather obscure and indistinct. When full-fed, which is between the 20th and 30th of May, it spins together the leaves of the whitethorn, forming a loose web, and in this changes into a pupa, which is slender in proportion to its length; the abdomen particularly slender and tapering: the head has two small approximate ears; the

eyes are projecting and prominent; the tail attenuate and acute. The colour pale brown, with a medio-dorsal black stripe. A specimen which became a pupa on the 23rd of May came out a perfect insect on the 4th of June. I am indebted to Mr. Moncreaff for this larva.—*Edward Newman.*

Description of the Larva of Acidalia remutata.—The egg is laid at the end of May or beginning of June, on the prostrate stalks of *Polygonum aviculare* (knot-grass); the young larva emerges towards the end of June, and is full-fed at the end of July, when it rests in an arched posture, the head and legs closely appressed together and forming a mass; when annoyed it tucks in the head and curls itself into a double ring, and in that unwonted posture frequently falls from its food-plant, feigning death. Head quite as broad as any segment of the body, prone, slightly notched on the crown; the cheeks gibbous, having a few scattered bristles: body very long and slender; the 2nd, 3rd and 4th segments broader than the rest; all the segments transversely and regularly wrinkled, and thus divided into numerous very narrow sections; 10th, 11th and 12th segments somewhat warty, and emitting scattered bristles. Colour various, sometimes light putty-colour, and every shade between this and dark umber-brown approaching to black: having, through the kindness of Mr. Wright, had the opportunity of examining a considerable number of examples, I find it impossible to fix on any normal ornamentation, but I may state that the dorsal surface of the anterior segments, from the 2nd to the 6th inclusive, is generally paler than the sides and ventral surface; in the lighter examples there are black markings in pairs down the middle of the back; but, as before hinted, the colouring is very inconstant.—*Edward Newman.*

Life-history of Ypsipetes clutaria.—The eggs are laid in July, on several species of *Salix*, *S. caprea* and *S. cinerea* being preferred: the young larvæ emerge in twelve days, and feed on the willow-leaves until half-grown, when they hibernate: in the spring the larva begins to feed again as soon as the leaf-buds of the willow expand: it then grows very rapidly, and is frequently full-fed by the 1st of June: it has a singular and hitherto unrecorded habit of secreting itself in the seed-down of the willow during the day, and of spinning this together in masses: it seems to feed principally

during the night. When full-fed it is an obese and lethargic larva, which doubles itself up and falls from its food-plant if shaken or annoyed. Head narrower than the body, scarcely notched on the crown, porrected in crawling; body rather depressed, and slightly attenuated anteriorly. Colour of the head clear brown, rather glabrous, the cheeks reticulated with black, the labrum entirely black; dorsal surface of the 2nd segment brown and shining, that of the following segments pale brown or smoky black, of very varied tint in different individuals, but in each individual the tint of the dorsal area is pretty uniform as far as the spiracles; it is, however, intersected throughout by two distinct pairs of white stripes, the inner stripe of each pair being the broader and more distinct; both are irregular and interrupted, and just below the spiracles is a third white stripe, still more obscure and interrupted: this third stripe serves as a boundary between the dorsal and ventral surface: ventral surface, anal flap, and claspers testaceous-brown; legs testaceous-brown, spotted with black: my larvæ made themselves cells in the down of the sallow-seed, and therein changed to bright brown and very glabrous pupæ on the 7th of June: the caudal extremity of the pupa terminates in two setiform processes, which are approximate at the base, but divergent at the tip. The moth appears on the wing in July. I am indebted to Mr. Doubleday, Mr. Pristo and Mr. Moncreaff for supplies of this species.—*Edward Newman.*

Description of the Larva of Dicranura furcula.—The eggs are laid singly on the leaves of several species of the genus *Salix*, more particularly *Salix capræa* and *S. cinerea* (sallows): the young larva emerges about the 1st of July, and may be found feeding throughout the month; it rests on the surface, with the ventral claspers attached to a silken coating, previously spun, on the upper surface of the leaf; both extremities are slightly elevated, the posterior more than the anterior. Head with the face very flat, and decidedly narrower than the 2nd segment, into which it is received, and by the anterior margin of which it is almost entirely concealed: 2nd segment dorsally flattened, the flattened portion being slightly dilated and quadrately truncated, the truncature terminating on each side in an obtuse angle; 3rd segment having a narrow portion dorsally flattened, and elevated

posteriorly into a narrow transverse ridge; 11th, 12th and 13th segments gradually diminishing into a conical mass, at the apex of which are the anal claspers, converted into two cylindrical tubes which are nearly parallel, closely approximate and directed backwards; they are beset both above and beneath with short stiff bristles, and emit a slender drooping filament from the extremity. Colour of the head pearly gray, tinged with purple; dorsal area of the body divided from the lateral area by a distinct white stripe, which is absent only from the 8th segment; this commences on each side on the 2nd segment, at the angles already described, ascends obliquely to the dorsal ridge on the 3rd segment, descends obliquely to the spiracle on the 7th segment, is lost and confused on the 8th, reappears on the 9th, and is continued thence to the extremity of the anal flap; on the upper margin of this white stripe, and immediately adjoining it, is a delicate purple stripe, and within this the dorsal area is white, with a median grass-green stripe, and there is also an oblique grass-green stripe on each side of the 7th, 8th, 9th, 10th and 11th segments; lateral surface apple-green, adorned with numerous roundish, purple spots, each ocellated with a central white dot and enclosed in a white ring; in addition to these are other larger and amorphous purple spots, possessing the white margin, but wanting the central dot; the 2nd segment has on each side in front a large purple-brown blotch, margined exteriorly with yellow; and on each side of the 7th and 8th segments are obscure orange patches; legs principally purple; ventral claspers apple-green, with a purple, V-shaped, white-margined mark descending into each; ventral surface apple-green; anal claspers or cylindrical horns nearly white above, with a tendency to purple, and a white ring at the tip. When full-fed the larva spins a glutinous cocoon on the bark of the willow, often towards the bottom of the stem, and changes to a pupa, in which state it passes the winter, the moth appearing about Midsummer following.—*Edward Newman.*

Description of the Larva of Dicramura bifida.—The eggs are laid separately on the upper surface of the leaves of *Populus balsamifera*, about the 1st of July, and the young larva emerges about the 14th; it appears to be full-grown about the 26th: it spins a silky coating near the middle of

the leaf of its food-plant, and, attaching itself to this, both by its feet and claspers, it is very difficult to remove ; it remains perfectly without motion during the day, exposed to the rays of the sun, and feeds during the night : after feeding it sometimes remains clasping the margin of the leaf it has been eating : when at rest the head is nearly withdrawn into the 2nd segment ; the 11th, 12th and 13th segments are elevated, and the anal horns closely approximate and pointing in a straight line backwards. Head prone, narrower than the 2nd segment, into which it is received ; the body rises from the head to the 4th segment, which is produced into a transverse dorsal ridge ; thence the body gradually tapers to the anal extremity ; the 11th, 12th and 13th segments forming a cone ; the anal claspers are changed into cylindrical tubes, each of which is covered with short bristles, which give it a scabrous feel as well as appearance ; and each of which also contains a slender filament, capable of being protruded at the will of the larva. Colour of the head grayish brown, the sides dark brown, the face delicately reticulated : dorsal surface gray-brown, marbled with darker and lighter shades, and bordered throughout with bright yellow ; lateral and ventral surface bright apple-green, dotted with purple-brown, and every dot emitting a small black bristle ; on the 5th segment the green colour extends completely round the larva, interrupting the dorsal brown area, which recommences in a point, and increases in breadth to the 8th segment, on which it descends below the spiracle ; it then gradually narrows to the 12th segment, and again expands on the 13th ; anal tubes green, with a brown patch on the inner side of each near the base ; a brown annulus beyond the middle, and a second paler annulus at the tip ; filaments black ; spiracles brown ; ventral surface of the 10th, 11th and 12th segments blotched with brown ; legs green, each joint with a red mark on the outside. When full-fed it excavates a portion of the bark of the tree on which it feeds, and in this constructs a very strong glutinous cocoon, so like the bark in colour as to be seen with difficulty. The moth appears in June following. My late beloved nephew, George Newman, found a great number of these larvæ at Leominster in 1865.

—*Edward Newman.*

Description of the Larva of Leucania Comma.—The egg

is laid on *Dactylis glomerata* (cock's-foot grass) and other grasses, in June, and the larva is full-fed the second week in August, when it feeds almost exclusively by night, reposing by day near the ground, on the stem of its food-plant, in a perfectly straight position: when annoyed it rolls itself in a compact ring, falling to the ground and remaining concealed at the roots of the grasses. Head semiglobose, of the same breadth as the 2nd segment: body almost uniformly cylindrical, slightly narrower towards the anal extremity; anal claspers projecting beyond the anal flap, slightly spreading. Head glabrous, wainscot-brown, delicately reticulated with darker brown, and having two dark brown stripes down the face, which are approximate on the crown, but divide towards the mouth, enclosing the clypeus; colour of the body wainscot-brown, variegated throughout the dorsal surface with delicate rivulet markings, of both darker and paler brown, and having four black dots, arranged as a trapezoid, on the dorsal surface of every segment from the 5th to the 12th inclusive; the 2nd segment has a semicircular semicorneous shield, its truncated margin next the head; this is traversed by three distinct pale stripes, which are continued indistinctly throughout the entire length of the larva, and are bordered with dark brown dots and shades, here and there massed into patches; spiracles intensely black, and immediately below them is a rather broad and very distinct pale stripe; ventral surface tinged with purplish semitransparent green; legs and claspers of the same colour: changes to a smooth brown pupa beneath the surface of the ground, and the perfect insect appears in June. I am indebted to Mr. Buckler for this larva.—*Edward Newman*.

Description of the Larva of Mamestra albicollis. — Egg laid in May and June, on the garden lettuce and other esculents: larva full-fed about the 20th of July, when it falls from its food-plant and rolls in a compact ring if disturbed. Head rather narrower than the 2nd segment: body almost uniformly cylindrical, very smooth and velvety, slightly decreasing towards either extremity. Colour of the head pale semitransparent green, glabrous; 2nd segment with its anterior margin lunately glabrous, and resembling the head in colour; body grass-green, with a medio-dorsal stripe slightly darker, and intersected by an extremely narrow paler stripe:

on each side just below the spiracles, and touching all of them except the 1st and 9th, is a pale stripe, interrupted by a darker stripe; claspers and legs concolorous with the body. I am indebted to Mr. Greening, of Warrington, for the opportunity of describing this larva.—*Edward Newman.*

Description of the Larva of Hadenä thalassina.—The time and manner of oviposition, as well as the natural food-plant, are unknown to me. The larva feeds freely in confinement on *Polygonum aviculare* (common knot-grass) by night, almost invariably retiring just below the surface of the earth by day: I once observed a specimen at rest, stretched at full length on one of the stems of knot-grass during the day, with its back downwards, and its anal claspers stretched out behind, but still grasping the food-plant: on being touched it instantly rolled in a compact ring. Head rather narrower than the 2nd segment, porrected, highly glabrous: body almost uniformly cylindrical, but slightly attenuated anteriorly, velvety; 12th segment slightly gibbose dorsally. Colour of the head pale dingy brown, delicately reticulated with darker brown; body dull brown, tinged with pink; every part beautifully and delicately reticulated with dark umber-brown, which colour forms a pair of oblique subdorsal markings; these pairs are indistinct towards the head, but increase in intensity to the 12th segment, on the back of which they are united; on each side immediately below the spiracles, which are almost white, is a well-defined light stripe, conspicuously tinged with pink; the upper margin of this lateral stripe is delicately bordered with white; the stripe itself is reticulated, but not so conspicuously as the dorsal surface; ventral surface, legs and claspers slightly paler and more semitransparent than the back, dotted and reticulated. Changes to a pupa, just beneath the surface of the earth, at the end of July: the moth appears on the wing in the following June. I am indebted to Mr. Doubleday for a supply of this larva.—*Id.*

Description of the Larva of Amphipyra Tragopogonis.—Feeds freely on *Cratægus Oxyacantha* (whitethorn). Rests with its back slightly incurved, the extremities being somewhat elevated, but not so conspicuously as in the *Notodontidæ*. Head narrower than the 2nd segment, into which it is partially received: body smooth and velvety, almost uniformly

cylindrical, but with the 12th segment dorsally raised into an angular protuberance. Colour of the head and body in one specimen glaucous-green, in another apple-green; in the glaucous specimen there are two narrow and rather distant white stripes, which commence very faintly on the 2nd segment, ascend, making an obtuse angle on the 12th, and vanish on the 13th; in the apple-green specimen these stripes are pale yellow; in both there is a lateral stripe, equally narrow, just below the spiracles; this also is white in the glaucous specimen, yellow in the apple-green one; it commences on the 2nd segment, and is continued the entire length and round the anal flap; this side stripe is margined above with black, the black being sometimes interrupted, but generally running from spiracle to spiracle, and surrounding each with a narrow black ring; the spiracles are oblong and pure white: scattered over the body are a few short and very slender bristles, only visible under a lens of moderate power: legs yellowish green: claspers concolorous with the body. The specimens, for which I am indebted to Mr. Wright, were full-fed on the 24th of May. They retired just beneath the surface of the earth on the 25th, and there changed to smooth pupæ, without spinning any web or cocoon. The perfect insect appears in July.—*Edward Newman.*

Description of the Larva of Catocala sponsa. — Rests in a nearly straight position on the branches of the oaks, on the leaves of which it feeds; the ventral surface appressed to the bark. Head somewhat narrower than the 2nd segment, but distinctly exserted; face flat, crown gibbose, notched: body convex dorsally, flattened ventrally; a fringe of flesh-like bristles divides the dorsal and ventral surfaces; 9th segment with a transverse dorsal ridge; 12th segment with a ridge also, but this terminates at each extremity in a lateral tubercle surmounted by a bristle; the 5th, 6th, 7th, 8th, 10th and 11th segments have each two wart-like tubercles placed transversely, each bearing a bristle; claspers long, dilated and divided at the extremity. Colour of the head wainscot-brown, reticulated with darker brown, and having a conspicuous black band surrounding the face, except towards the mouth; within this, and very near the crown, are two eye-like black spots: dorsal surface of body dull brown, reticulated with pale wainscot-brown; the tubercles, as well as

certain minor warts, rufous-brown and very glabrous; a pale transverse dorsal mark on the 5th segment; ventral surface whitish, inclining to glaucous, with a rufous patch between each pair of ventral claspers. Full-fed on the 8th of June, when it spins a thin web among the oak-leaves, without descending to the ground: the perfect insect appears in July. I am indebted to Mr. Wright for this larva.—*Edward Newman.*

Entomological Notes and Captures.

Larva of Sesia philanthiformis discovered in the Isle of Man.—From information given to me by my friend Mr. Doubleday, when at his house last July, that the larvæ of *Sesia philanthiformis* (of Staudinger) fed upon the thrift, and having purchased a pair of this insect, for 15s., which were captured in the Isle of Man, I determined to make a journey there in May this year to search for larvæ or pupæ, and on carrying out my plan I discovered its larvæ feeding in the stems of the sea-pink which grows in profusion all round the island. I have since succeeded in breeding a long series in magnificent condition, and have sent a specimen of the larva to be figured by Mr. Buckler. Another time I may trouble you with further particulars. — *C. S. Gregson; Rose Bank, Fletcher Grove, Stanley, Liverpool, June 22, 1866.*

Capture of a Noctua new to the British Isles.—Three hours after I landed on the Isle of Man for the first time (though I had often seen it before), I captured a *Dianthœcia* quite new to me, and before I left I secured what, through the kind assistance of friends, especially of Mr. Doubleday, who kindly sent me specimens from his continental collection for comparison, we now make out to be a singularly permanent variety of *Dianthœcia* [*Noctua*] *cæsia* of the Vienna Catalogue, *N. dichroma* of Esper. As I purpose sending a full account of it when I have a little time, I will only say now that it is a very fine bluish lead-coloured insect, almost devoid of distinct markings, except a few yellowish spots or patches: it is suffused and rough-looking as a frieze coat, and as it is such a decided and permanent variety I propose to call it *var. D. Mananii*, after Manan, first King

of Man. It may interest some of your readers to know that I took a variety of *Dianthæcia capsophila* freely during my stay: they varied considerably in colour, and were finer than any I have ever taken at or seen from the Hill of Howth, near Dublin, or in Cumberland. — *C. S. Gregson*; June 22, 1866.

Mamestra aureo and *Dianthæcia capsophila* in the Isle of Man.—It may interest some of your readers to know that while paying a visit to the Isle of Man, along with my friend John Bleakley, we captured *Mamestra aureo* and *Dianthæcia capsophila*, besides others of less note.—*Wm. Parry*; 310, *Oldham Road, Manchester*, June 17, 1866.

[I have no knowledge of *Mamestra aureo*: will my correspondent kindly say whose name it is?—*E. Newman*.]

Agamogenesis in Orgyia antiqua.—The details of this case were communicated to me by a friend, who has satisfied me that perfect isolation from the male was maintained throughout. First generation:—From a pupa found at Venn Hall, Sherborne, Dorset, in the autumn of 1864, a female imago emerged which laid eggs. Second generation:—Of the above-mentioned eggs ten hatched in the spring of 1865; but of these larvæ one only, the largest from the first, came to maturity; this produced a female which laid eggs. Third generation:—Five larvæ from these eggs attained the pupal state of development, and one of them produced a female imago by the middle of October. The series is, therefore, yet incomplete.—*A. E. Eaton*, in *Ent. Mo. Mag.*, Jan. 1866.

Cicindela campestris smelling of Roses.—On the 8th inst. I took several of this species on Wimbledon Common, all with a strong rose-like scent. I never observed it before, though I have often taken them there. Do you think they only have the scent at some particular period of their life?—*N. C. Tuely*; *Wandsworth*, May 10, 1866.

Necrobia ruficollis feeding on Cheese and Ham.—The enclosed beetle makes great ravages in our cheese, hams, &c. Would you have the kindness to inform us, at your earliest convenience, if you know of any means to kill such, or any other kinds of beetles, flies, &c., that infest provisions, without fear of injury to the hams, cheese, &c., affected? If you could give us any information, you would greatly oblige us.—*R. Ward & Co.*; 9, *Kirkgate, Leeds*, June 7, 1866.

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[PRICE 6D.

Revision of the ' Catalogue of British Coleoptera.'

By G. R. CROTCH, Esq.

WHEN, in 1863, I undertook to compile a list of our native Coleoptera, I was far from comprehending the difficulty of the undertaking, notwithstanding that there was already one in existence. This and the almost unprecedented increase of our fauna have rendered my list far behind the age, and I have hence determined to embody the latest discoveries in a still more compact form. But as it is very desirable that the reasons for any alterations in nomenclature, additions, &c., should be recorded, Mr. Newman has kindly allowed me to develop my views in his valuable journal. Priority has been the basis of my synonymy, and great care has been taken to restore the names of English authors, where such a proceeding seems justifiable. With these remarks I will at once proceed to enumerate such species as may call for remark.

Cicindela campestris (*C. nigrita*, *Dj.*) is erroneously inserted. The variety alluded to is *C. funebris*, *St.*, a nearly black form of *C. campestris*, which was once taken in Sutherlandshire.

C. hybrida.—Our species is peculiar, in both its forms, to the coast; while the typical *hybrida*, *Auct.*, is common everywhere, but more especially inland, and is rarely found on the sand-hills. Our two forms are not only one and the same species, but both correspond with *C. maritima* of Dejean, and only vary in size and in the form of the central band: these characters are locally well marked on our coasts, but a series of Belgian and Swedish examples will soon show that neither character is in any way constant. Mr. Curtis's example, taken at Epping, on which *C. sylvicola* of Stephens was founded, appears to have been the typical *C. hybrida*.

Notiophilus aquaticus, *L.*—The link between this species

and *N. palustris* is accurately furnished by *N. laticollis*, *Chd.*, and *N. Germinyi*, *Fr.*; indeed I have seen intermediate specimens in this country.

Notiophilus 4-punctatus. — The impressed points on this species vary, being occasionally absent on one side; but other slight differences in sculpture confirm its claim to be considered a special form of *N. biguttatus*, and not a mere *sport*: thus the sculpture of the thorax differs, and the striæ of the elytra are finer and less punctured.

N. substriatus. — The type-form, *N. geminatus*, *Dej.*, is found in S. Europe, and differs in having the frontal striæ more numerous and the elytra unicolorous; whereas in our form they have always a yellow spot at the apex.

Calosoma Sycophanta certainly occurs in England, but I cannot conceive that any doubt can exist as to its having been accidentally introduced in every instance.

Carabus. — Whether all the records of *Carabus auratus* are to be believed, and, if so, whether they indicate more than an analogous tendency to accidental occurrence, is open to doubt. For *C. cancellatus* the evidence appears to me more slight; but, besides the original ones, two examples have occurred, one recently, and are certainly authentic. *C. convexus*, I think, is most probably British: Mr. E. S. Saunders has an example purporting to come from Ireland. It certainly might be overlooked, if as local as *C. intricatus*; but even this could hardly be said of the others, and they would be readily introduced in ballast, &c.

Brachinus explodens. — To put this and *Lebia hæmorrhoidalis* in Italics, after the careful discoveries of Mr. Sidebotham, must seem at first very much like a deliberate insult to that gentleman. I feel sure, however, that he will not view it in that light, especially as I have striven to mete out the same measure to myself *in re* *Eu. sticticus*, *Sit. gressorius*, &c. The fact is that before a species can be fairly registered as British it must be shown to have some sort of metropolis where it can be found, though perhaps with difficulty. So many isolated things have occurred which time has not confirmed, that one is led to doubt these casual occurrences perhaps to too great a degree. Admitting perfectly that this species and *Lebia hæmorrhoidalis* were taken in Britain, it does not nevertheless, in my opinion, stamp them as being certainly British insects.

Drypta emarginata.—Dr. Schaum first restored Rossi's name; but he did not notice that Fabricius only adopted a name from Olivier, whose work is coeval with Rossi's (1790), and infinitely superior. The old synonymy must therefore be retained, substituting Olivier for Fabricius.

Dromius monostigma, *Lch.*—This insect is recognisably described under this name in Samouelle's 'Compendium,' at least five years before Germar mentioned his *D. unipunctatus*.

D. maurus.—In the type-form of this species (*D. glabratus*), not as yet recorded to occur in England, the colour is a little more bronzed; the elytra much longer and obsoletely striate.

Cymindis basalis.—The description of Linnæus has been fitted to this species somewhat unjustifiably. The original diagnosis in the 'Fauna Suecica' cannot apply to it, describing it as he does as one of the smallest in the genus, and found in his garden in hot-beds.

Calathus flavipes.—I adhere here to the name used by Dawson. Gyllenhal thought to recognise the *fulvipes*, *Fabr.*; that insect, however, corresponds with *Harpalus latus*, *L.*; hence another name is requisite, and Fourcroy's name, supplemented by Geoffroy's description, appears sufficiently applicable.

C. mollis.—I cannot but consider *mollis* a mere form of *melanocephalus*; it is even at times very hard to distinguish them, and with the intervening links, as *C. ochropterus*, *Dj.*, &c., it is almost impossible; at the same time, in this country, they are generally sufficiently easily separable, and may be found in company.

C. piceus.—Marshall adopted Linneus's name, which, however, belongs to *Anchomenus*; hence Dejean's must be preferred.

Taphria vivalis.—Illiger was the real describer of this species, though Panzer figured it before him; hence his verdict is to be looked to. He says that Panzer called it "nivalis" by mistake, and it is easy to see that it would then have come into collision with *C. nivalis*, *Pk.*

Anchomenus juncus.—In the absence of uniformity I am inclined to follow Dawson in restoring Scopoli's name; his description is scarcely applicable to any other insect, certainly not to *Nebria Gyllenhalii*, as Dr. Schaum suggested.

Anchomenus atratus.—The type-form does not occur here, but is found in Austria; it differs in the elytra and the form of the thorax. *A. pusillus* occurs also in France and Spain.

A. Thoreyi.—*A. pelidnus*, *Daws.*, certainly does not seem to differ from *A. Thoreyi*, except in its darker colour; but some specimens taken in Scotland, by Mr. Sharp, differ slightly, but apparently constantly, from the English form; these probably correspond with the true *puellus*, *Dej.*

Pterostichus cupreus.—Sturm distinguished the red-legged form as *P. affinis*. His *P. versicolor* is smaller and narrower, but certainly not specifically distinct.

P. orinomum.—This cannot well be considered more than a form of *P. vitreus*, from which it differs by its shorter thorax. *P. vitreus* occurs over the whole North of Europe to Kamtschatka.

Amara acuminata.—I do not see why Dejean's name is to be altered. *A. eurynota*, *Pz.*, was published a year previous to Paykull's work, and was accompanied with a figure.

A. obsoleta.—Dr. Schaum showed that Dejean's name could not be used, as he misinterpreted Duftschmidt; but the Fabrician *ovata* does not correspond with the *ovata* of Paykull. Hence a name is still to be sought for this species.

Harpalus obscurus.—This species is no doubt *obscurus*, *F.* (sec. ej. *Mus.*), but the name was long before applied to an *Anchomenus* by Herbst; hence Dejean's name should be retained. It closely resembles *H. sabulicola*, but the elytra are dull green, and the thorax has the angles rounded; the elytra also are sinuate at the apex.

H. diffinis.—Mr. Rye has united this with *H. rotundicollis*, but we certainly have two species. Mr. Janson sent examples to the late Dr. Schaum, which he examined with great care, and one of which was the true *H. diffinis*. It differs from the common species by its elytra being scarcely sinuate at the apex, and its thorax more rounded at the sides. This specimen is the only one I have yet seen.

H. puncticollis.—If these forms are admitted, certainly others will have to be made which at present make apparent links between them. I believe M. Chaudoir contemplates describing some additional species of this character.

H. griseus.—Two recent examples were taken near London by Mr. Janson.

Harpalus attenuatus.—Stephens's name is indeed anterior by a year to Dejean's, but his description is quite irreco-g-nizable, buried as it is among a mass of imaginary species; he also described it as *H. picilabris*: hence Dejean's name should be retained.

Stenolopus dorsalis.—The French authors consider *S. brunnipes* as a mere dark form of *S. dorsalis*, an opinion in which I decidedly concur; but the Azorian species, ranked as *brunnipes* by M. Morelet, is very distinct.

Bradycellus rufulus, *Dj.*—Duftschmidt's name, brought forward by Dr. Schaum, appears to me very doubtful. He probably mixed more than one species, and certainly Dejean was the first to clearly separate the three; hence, if he did not adopt any of the earlier names, we cannot alter his. Marsham's name, besides being valueless as far as his description goes, is already preoccupied.

B. collaris.—I believe we have true northern exponents of this species, but the intermediate forms of *B. harpalinus* are so close that I can only consider them races of one species; indeed I am far from satisfied with the distinctions between the preceding species.

Trechus minutus.—*T. obtusus*, *Er.*, appears to me a more alpine form of *T. minutus*; indeed even in the low grounds *T. minutus* strays into the *obtusus* form. Its apterous condition is additional confirmation of this.

Perileptus.—The genus *Blemus* was not characterised by Ziegler. Stephens first gave its characters, and made it include our *Trechus*; hence a new name became necessary for *B. areolatus*.

Bembidium biguttatum, *F.*—This species divides well into two forms; one $2\frac{1}{4}$ lines long, common in N. Europe, and doubtless the one first described by Paykull (1790), to which I have restored his name; the other smaller and very like *Bembidium guttula*, differing from the former by the seventh stria of the elytra being distinct. *B. æneum*, *Germ.*, may also be ranked as a coast form of this species, to which it bears much the same relation that *B. Mannerheimii* does to *B. guttula*.

B. assimile, *Gyl.*—*Bembidium Clarkii* is apparently at once distinct from this species, but the characters shade off almost imperceptibly; certainly I have seen leads which

justify their union as races, if not affording an absolute gradation.

Bembidium lampros, *L.* — *B. velox*, *Er.*, is distinguished by the presence of the seventh stria on the elytra, and is rare in this country.

B. affine.—This name is preoccupied by Say (1825) and Le Conte; hence I have proposed the name *Stephensii* for this species.

B. tibiale and other species are referred to their type-forms, after the Monograph of M. Duval, whose opinions are shared by most continental Entomologists. It is impossible, from the isolated evidence afforded by the specimens found in this country, to judge one way or the other; but at least the fact of the stem-form not occurring in this country is no disproof of their connexion, but rather the reverse.

Hydroporus rivalis. — *H. Sanmarkii* is universally considered a good species, and it certainly has strong claims to be so regarded. Varieties of *rivalis* are often confused with it; it occurs with that species, but is much rarer, and I have only regarded it as a form of *rivalis* because I can see no difference except in coloration.

H. victor.—*H. ferrugineus*, *Steph.*, is the oldest name, but the existence of *H. ferrugineus*, *L.*, in the same family and in a closely-allied genus, renders it unadvisable to restore it.

H. oblongus.—This name is prior by a few years to that of Sturm, and must be restored.

H. piccus. — Stephens's description clearly applies to this insect, and Dr. Aubé had long ago recognized this; his collection, however, does not correspond, and this misled Dr. Schaum into preferring Schiödte's name; but he had told me that he should revert to Stephens's name in his work on the Hydradephaga, which it is to be hoped may yet be brought out.

H. tinctus, *Clk.*—The two types remaining in Dr. Power's collection do not appear to me to differ sufficiently from *H. palustris*.

Agabus.—The following sections have been established in this genus by Thomson, and are very useful, viz.: *Gaurodytes*, embracing the greater portion of the genus, and having the laciniae of the metasternum broad and triangular—in the others these parts are linear; in *Liopterus* (*agilis*) the

laciniae are angulate, the elytra acuminate; in *Platambus* (maculatus) the thorax has the posterior angles produced; and in *Erigenus* (abbreviatus) these angles are rectangular.

Agabus dispar.—If Linnæus's name of *uliginosus* be used for the *Ilybius*, it is impossible to retain it for this also, both because they would be much too near in position, and because Paykull quotes Linnæus; hence Mr. Bold's name will have to be retained.

Heterocerus arenarius, *Ksw.* — This species was long ago introduced as British by Mr. Haliday, in the 'Natural History Review,' but had apparently escaped notice.

Elmis troglodytes, *Gyl.*—This species is very closely allied to *E. tuberculatus*, but is markedly smaller, and has the thorax longer and the elytra more visibly punctate-striate. I have seen it hitherto only from the North.

Helophorus granularis.—This is one of those species of *Philhydrida* which seem to vary in almost every locality. I certainly am unable to make them into defined species, unless three or four more be added, and this may ultimately prove to be the correct view: at present I feel much in want of further material, and have what appear to be three good and undescribed species, which are, however, represented by single specimens only.

H. Mulsanti.—This name has been given by Mr. Rye, in his 'British Beetles,' p. 255, to the *dorsalis* of Mulsant (*nec* Marsh). The only specimens I have seen are my own, found at Liverpool. The true *dorsalis*, *Marsh.*, is the 4-signatus of continental collections, an insect found in various parts of the country, especially the woods of Leicestershire, &c.

Hydræna Sieboldi.—This name has been retained, rather than that of Mr. Waterhouse's (which has priority), because *pygmæus* is already in use in the closely-allied genus *Ochthebius*. Much trouble would be saved if authors would avoid the repetition of the specific names, not only in the same genus, but in the same family. The limits of genera are often uncertain, and hence alterations may continually be necessary.

H. flavipes.—This species was described by Mr. Waterhouse as *atricapillus*, but was referred to a new genus, of which the characters were incorrectly exposed; hence the name cannot be retained.

Hydræna atricapillus.—Paykull did not describe this species first, but adopted it from Fabricius; he, however, had only *Philhydrus testaceus* in view: hence Stephens's name should be employed.

Hydrobius globulus, *Pk.*—Fabricius described this irrecognizably as a *Sphæridium*; hence Paykull's name, though later in date, should be retained.

Berosus signaticollis.—Charpentier's name has four years' priority over Curtis's, and is also accompanied by a figure.

Limnebius picinus.—There is nothing salient in Marsham's description, and the specimen in Stephens's collection (which is a Marshamian type according to him) corresponds with *L. nitidus*. In this doubt it seems better to adhere to the ordinary usage.

Cercyon marinum, *Th.*—Thomson has divided Mulsant's *aquaticum* into two species, *C. marinum* and *C. palustre*. I inadvertently introduced the latter into my Catalogue, but it has not to my knowledge been found here. *C. aquaticum* of Stephens appears to correspond with *C. anale*. Hence Thomson's name should be retained.

C. plagiatum, *Er.*—Marsham's description is inapplicable: it more properly applied to a brightly-coloured hæmorrhoidale.

C. centromaculatum. Marsham's description corresponds with a pale variety of *pygmæum*. There is no allusion to the central shade which is the great feature of this species.

Megasternum boletophagum.—Marsham's description and name certainly apply well to this species, and, whatever his *type* may be, his diagnosis was never drawn up from *C. minutum*: hence I see no reason to substitute the less expressive name of *C. obscurum*; but all these *Cercyons* were brought into comparison by Marsham and Stephens, who quite failed to catch the specific characters.

(To be continued.)

G. R. CROTCH.

University Library, Cambridge.

Description of the Larva of Acidalia contiguaria.—Feeds on *Calluna vulgaris* (common ling). Generally rests in a

straight position, projecting like a little dried twig, which it closely resembles, but sometimes with the back arched: the legs are crowded together towards the mouth and directed forwards. Head about the same width as the 2nd segment, prone, the crown prominent and slightly notched: body long and slender, attenuated towards the head, conspicuously wrinkled transversely throughout; claspers slightly spreading. Colour of head dark brown, with two pale stripes down the face; dorsal surface of the body wainscot-brown above, with a double medio-dorsal dark umber-brown stripe on the 11th, 12th and 13th segments, and a few dark dots on the rest; ventral surface dark umber-brown, the medio-ventral region rather paler. I am indebted for this very rare larva to Mr. Greening, of Warrington.—*Edward Newman*.

Description of the Larva of Larentia multistrigata.—The egg is laid in April, on the different species of *Galium*, but feeds freely on *Asperula odorata* in confinement. Rests in a nearly straight or slightly arched position, the feet as well as the claspers generally attached, and the head prone and tucked under. Head as wide as the 2nd segment, not notched on the crown: body uniformly cylindrical, the segmental divisions well marked, the lateral skinfold rather prominent. Colour of the head and body gray-brown, occasionally tinted with pink or yellow; a narrow medio-dorsal clearly defined darker stripe runs from the 2nd segment to the tip of the anal flap; three broader, less regular and less clearly defined stripes run along the sides parallel with the medio-dorsal stripe and between this and the spiracles; ventral surface paler than the dorsal surface, and having an extremely slender and delicate medio-ventral stripe; and between this and the spiracles are three other stripes, all of which are sinuous, and that nearest the medio-ventral is double; the spiracles are intensely black; in addition to the stripes are numerous dots, extremely small, darker than the general surface, and each emitting a minute bristle. Many of my kind correspondents have supplied me most liberally with these larvæ.—*Id.*

Description of the Larva of Scotosia certata. — Feeds on the leaves of *Berberis vulgaris* (barberry), a plant formerly abundant in our eastern counties, but now in the process of extermination, under the insane idea that it produces blight

in wheat.* My kind friend W. R. Jeffery, of Saffron Walden, has sent me a dozen of these larvæ, greatly varying in size: when young they spin together two leaves of the barberry, adjusting the edges with so much care that the two leaves look like one; the back of the upper leaf I always find applied to the face of the lower; and between these leaves the enclosed larva rests in a curved posture, the head brought round to touch the side of the 10th segment, but the larva always resting on its ventral surface, and not ring-fashion: in this retreat it eats the cuticle and parenchyma of the upper leaf, its operations betraying its whereabouts by the appearance of a large brown blotch on the surface. The full-fed larva is obese and somewhat depressed, the head glabrous, narrower than the body, which is of nearly uniform substance throughout, and furnished, on the sides especially, with minute scattered bristles: there are no excrescences. Colour of the head wainscot-brown, with a few black dots: body with the dorsal surface dull lead-colour, bordered with a blackish stripe on each side: beneath this is a series of orange spots, and in the middle of each spot a black spiracle: ventral surface pale smoke-colour, with two darker blotches on each side of each segment, the upper of which is small and roundish, the lower larger and longer; intermediate between the lead-coloured dorsal surface and its marginal dark stripe is a series of white dots: the legs are dark; the claspers concolorous with the ventral surface. Full-fed on the 6th of July.—*Edward Newman.*

Description of the Larva of Dianthæcia casia.—Mr. Gregson having watched a female of this new British moth depositing her eggs on the flowers of *Silene inflata*, in the Isle of Man, gathered the flowers, and has succeeded in

* In some of our western counties frogs are destroyed by gardeners under a charge of feeding on strawberries! I believe there is no way of enlightening the public on these subjects: I recollect once seeing a hedgehog convicted and executed on a charge of milking cows; I showed the executioner the impossibility of the animal getting the cow's nipple into its mouth, but his triumphant although rather vague reply was, "They stretch to anything." In the instance of the barberry the so-called "blight" is a fungus, and is supposed to be identical with a somewhat similar fungus highly injurious to wheat, but the two are of different genera, and there is no ground whatever for supposing there is any connexion between them.

obtaining larvæ, which, being full-fed on the 6th of July, he has most kindly transmitted to me for description. The usual position of the larva is with the head and anterior extremity partly concealed within the capsule or inflated calyx, and the anal claspers tenaciously holding the slender footstalk of the flower. The head is of nearly the same width as the 2nd segment, somewhat glabrous, and emits about twenty minute bristle-like hairs: the body is nearly uniformly cylindrical and velvety; it has a few short and slender bristle-like hairs along each side, but these are so few and inconspicuous as only to be observed under a lens of considerable power. The colour of the head is pale wainscot-brown, slightly reticulated with darker brown markings, in one specimen so slightly as only to be observable under a lens; there is a blackish dot at the insertion of each hair, and the ocelli are also dark: body pale brown, very minutely and densely irrorated with umber-brown; these irrorations are crowded in some parts, but more distant in others, leaving a double longitudinal series of irregular pale patches, which form two indistinct stripes; ventral surface, including legs and claspers, pale smoky brown slightly tinged with pink. Of its subsequent life-history we at present know nothing. — *Edward Newman.*

Entomological Notes and Captures.

Acronycta Alni at Lilleshall, near Newport; and *Hepialus Hectus*, var., in Sussex.— I have recently made two captures which may be worth reporting; the one a fine specimen of *Acronycta Alni*, at sugar on an alder at Brockenhurst, New Forest, on May 31st; and a pretty variety of the female of *Hepialus Hectus* in Pett Wood, Sussex, on June 20th: the latter, unlike the ordinary female *Hectus*, has not a pale brown ground-colour with darker markings, but is of nearly as warm an orange-tawny as the male, with slate-coloured markings edged with pale fulvous-yellow, these markings—which is not usual with the female of this species—exactly tallying in shape and position with the bright metallic markings of the male: the under wings are dark ashy brown, with a tawny fringe, the fringe on the upper wings being

spotted with slate-colour. Mr. Doubleday has seen the specimen, and pronounces it to be a variety of the female *Hectus*: he says he has met with other specimens closely resembling it in colour and markings.—(Rev.) *Percy Andrews; Lilleshall, Newport, Salop, July 10, 1866.*

Chærocampa Celerio and *C. Porcellus* at *Malvern*.—My cousin took a specimen of *Chærocampa Celerio* at Malvern last October, and *C. Porcellus* appears to be common here.—*Stephen P. Smith; Malvern Link, July 17, 1866.*

Mamestra auredo.—In reply to the query respecting this name (*Entom.* iii. 104), I beg to say that, not knowing the insect when I captured it, I showed it to a well-known Entomologist, Mr. J. B. Hodgkinson, and he gave it the name I employed: I now find it ought to have been *Dianthæcia cæsia* of the continental list, and I think it ought to retain that name; but if it were to have another name I must claim the honour of naming it, as my notice of it was five days earlier than Mr. Gregson's. I hope my numerous correspondents will kindly take this as an answer to their inquiries respecting this insect, as I have disposed of the specimens to Mr. Carter.—*William Parry; 310, Oldham Street, Manchester, July 15, 1866.*

Sesia Philanthiformis.—It was my friend Mr. John Bleakley who had the good fortune to capture the first pair of this insect in the Isle of Man: this was the pair alluded to in Mr. Gregson's note (*Entom.* iii. 103).—*Id.*

Answers to Correspondents.

W. O.—The insect is *Sirex Gigas*: the instrument which you suppose a sting is an ovipositor: the larvæ of this insect are doing incredible mischief in our plantations of larch, by boring into the solid wood and mining it in all directions.

E. J. P.—The common rose-beetle (*Cetonia aurata*): it breeds in decayed wood, very frequently in that of apple trees, and also in spent tan after it has been lying exposed to the weather for some years.

R. J.—The name of the beetle is *Serropalpus humeralis*: it was formerly considered excessively rare in this country, but in 1861 considerable numbers were taken. An admirable

life-history of this insect was published in the 'Annals of the Entomological Society of France,' in 1857, by Mons. E. M. Perris: I translated and reprinted the paper in the 'Zoologist' for 1861, at p. 7411.

Henry Doubleday.—I am obliged for a notice of the error; it was a misprint: the fox-moth spins its long cocoon at the end of March, not of September. (See Entom. iii. 94, line 7).

Captain Hadfield.—The beetles found in the stomach of the pipit are *Agriotes lineatus*, *A. obscurus* and *A. Sputator*. The larvæ of these three species are well known, under the name of wireworm, as most injurious to the crops, especially of wheat: the pipit is therefore a most useful bird at this season.

T. P. N.—The useful larva of *Syrphus Pyrastris*, one of the Diptera: its occupation on the rose-bushes is as a destroyer of Aphides; the mode in which it seizes them is graphically and truthfully described in Kirby and Spence, i. 265: De Geer says it eats no other Aphis but that of the rose.

Stephen P. Smith.—Your larva is certainly *Dicranura bifida* or *D. furcula*, I cannot be certain which; but I attempted to make the difference clear (Entom. iii. 97, 98).

J. P.: Leaf-cutter Bees.—In answer to J. P.'s inquiries (and parenthetically let me observe that I am always delighted to receive such inquiries), I may state that the specimens sent are portions of the petals of pelargoniums, and of the leaves of Fuchsias and enchanter's nightshade, the cuttings on the edges, always portions of a circle, having been made by a species of *Megachile*, or leaf-cutter bee. Linneus regarded the whole of this genus as constituting but a single species, which he called *Apis centuncularis*; but the late venerable entomologist Kirby, and, almost simultaneously, the illustrious Latreille, divided this little group into several species, giving to the most familiar and abundant, the willow bee of Ray, the specific name of *Willughbiella*. Whether either of these great entomologists intended a pun I have no means of ascertaining, but their assigning to the familiar willow bee the Latin name *Willughbiella* has rather a suspicious appearance. Be this as it may, a mention of the industrial labours of the willow bee, even though these may be deemed by many a thrice-told tale, is quite in place in the pages of the 'Entomologist.' Reaumur (vol. vi. pp. 139—48) seems to have been the first to observe and record the

peculiar economy of these bees, but his narrative has been so pleasantly rendered in English by Kirby and Spence, in their 'Introduction to Entomology' (vol. i. p. 440), that I would, in preference, commend that more accessible work to my readers. It happens, however, rather unfortunately, that the instructive and graceful passage in question refers to a bee that is not known as an inhabitant of Britain, and, moreover, that all the leaf-cutters do not work by the same design, or select the same site for their architecture. The leaf-cutters with whom I enjoy the honour of a personal acquaintance excavate a longitudinal burrow in some decaying post or rail, or in the dead wood of a willow tree: I have most commonly found them in the horizontal rail of an old fence. Reaumur's bee decorated her dwelling with cuttings from the petals of the field poppy, but her English relatives, or at any rate some of them, exhibit a yearning for still more gorgeous ornamentation, and drape their nurseries with the petals of pelargoniums, sometimes even selecting that intense scarlet which is justly regarded as the *ne plus ultra* of floral colour. The burrow is cylindrical, about the size of a lady's finger, and usually seven or eight inches in length: I measured one last summer at the residence of my friend Mr. Barrett, at East Dulwich, and found it exactly eight inches and a half in length: it contained seven thimble-shaped cells, placed in a row, the convex extremity of one thimble fitting into the concave extremity of the next, and all of them were lined with cuttings of rose-leaves, and the ends of each cell plugged with the same. I observed that for the *convex end* of each cell perfectly circular pieces were used, while the *lining* was composed of differently-shaped pieces, and was four layers in thickness: the cells, when I saw them, contained bee larvæ of a very considerable size; these, however, never attained maturity, on account of the activity displayed by little fingers in their attempts to learn the life-history of these amusing visitors. It is a pleasant thing to watch the operations of the parent bee when cutting out her upholstery: she settles on the notched edge of a rose-leaf, and, cutting away with her jaws as with a pair of scissors, separates, in an incredibly short space of time, the desired fragment, and, holding it suspended between her legs, wings her way to the future nursery of her young ones.—*Edward Newman.*

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[PRICE 6D.

Revision of the ' Catalogue of British Coleoptera.'

By G. R. CROTCH, Esq.

(Continued from page 112).

Choleva longula, *Kelln.*—I do not know what M. de Marseul's authority may be, but I imagine he has acted here on slight grounds in stating that the *C. longula* of Kellner and Murray are two species. Mr. Murray saw types from Kraatz himself, which agreed with what he had seen in England. I have seen Mr. Bold's specimen, and have one myself, a female: it seems to me to be Thomson's *pilicornis* without doubt, and is certainly different from *tristis*; the eighth joint of the antennæ is much larger, and the femora are simple beneath, in the male. This difference in the antennæ, which could hardly go unremarked, leads me to doubt whether it is the real *C. longula*, *Kelln.*, or whether that is founded, as Mr. Murray supposed, on elongate forms of *C. tristis*, with a thinner club. Certainly I have seen specimens quite answering to the description. *C. grandicollis* is very distinct, the male characters being unlike any other species.

Silpha dispar.—This is often represented by specimens of *S. opaca* in collections, and appears to be rare, though it is perhaps only overlooked. *S. opaca* may be known at once by the 4-jointed club to its antennæ. *S. dispar* and *S. sinuata* resemble each other more, but the former has the elytra very little produced in the male, and the interstices are clothed with a fine golden rather scattered pubescence.

Anisotoma.—*A. silesiaca* of my Catalogue was founded on a specimen of *A. ovalis*, as has been already pointed out. *A. scita*, brought forward at the same time, was founded on *A. ornata*, *Frm.*, a species not then registered as British. *Cyrtusa pauxilla* and *Agathidium conformis* appear to me to be probably good species, but they do not entirely accord

with Erichson's descriptions. His insects have not, I believe, been re-found since his time.

Anisotoma ornata.—Mr. Rye has restored Stephens's name, but he only described the colour, having no knowledge of its real differences from *Anisotoma calcarata* in the thorax and posterior femora; hence M. Fairmaire must be regarded as the founder of the species. The colouring, moreover, is common to *A. dubia* and *A. calcarata* at times, and is not constant here.

Liodes axillaris.—This species was introduced by me on small examples of *L. humeralis*, in which the tarsi were less developed, and the femora simple beneath, in the male; but in the true *L. axillaris* the gemination of the striae is much more apparent, and the elytra are glabrous.

Clambus punctulum.—The four species of Clambi seem found nearly all over Europe, two being pubescent and two glabrous. The present one differs from its ally, *C. minutus*, in being about half the size, and gradually attenuate behind. The coloration is, moreover, different in the normal form, but it varies considerably.

Sphærius.—This name has been used on several occasions, both in insects and in other groups; hence I have retained Kolenati's name, given only a few years later.

Trichopteryx.—I have followed M. Motschulsky and Mr. Wollaston in altering this name, and conceive that it is in accordance with the law of priority, though changes are always to be regretted. The numerous changes in specific nomenclature have been noticed already by Mr. Matthews. He, however, appears to consider it unnecessary to change M. Thomson's name, but the same name should never recur in the same family, if possible, especially when, as here, all had been united in a single genus. For the same reason I have used Aubé's name for the *Ptilium trisulcatum*, as Linneus first gave that of *minutissimus* to an *Acrotrichus*, and was followed by Marsham; hence Weber's could not be adopted.

Olibrus liquidus.—Mr. Wollaston has restored Stephens's name to this species, but the description distinctly speaks of *one* sutural stria, which is a character of *O. geminus*. Mr. Rye has employed Erichson's name. The species is probably a race of *O. bicolor*, but the type-form does not occur

here, though very common in Europe generally, while *O. liquidus* is peculiar to the South-West.

Cercus pedicularius. — Almost the only difference given between this species and *C. bipustulatus* is the length of the elytra, and even this does not hold. The extremes look very different, but many specimens will be found almost intermediate.

Nitidula obscura. — The *Silpha rufipes* of Linneus corresponds with *N. obscura*, according to his collection, but the great proportion of authors refer it to *Meligethes rufipes*. The description would suit either, but it cannot be retained for both.

Meligethes ochropus. — Mr. Rye informs me that Mr. Waterhouse has specimens similar to my own, and that they do not agree with the types of Erichson's species. I have therefore added a note of doubt to the identification.

M. Marrubii, *Bris.* (Cat. Col. Fr. 54, 70). — About the size and form of *M. serripes*, but at once known from any of our species by the armature of the intermediate tibiæ, which have very strong setæ, giving them the appearance of the anterior ones. One specimen at Weston.

M. ebeninus, *Frst.* — This species evidently belongs to the lugubris group, but is very distinct by its sparse punctuation and very black appearance: I have only seen two females as yet, hence cannot identify it with certainty with Forster's species.

M. obscurus, *Er.* — Nearly resembles *M. erythropus*, but is larger and with dark legs. Two specimens from the North.

Cerylon angustatum, *Er.* — Stephens appears to have described one of the red species under the name of ferrugineum, but Erichson, being unable to identify it with any one of his three in particular, was obliged either to pass it over or to apply it arbitrarily. He preferred the former, and I conceive that we are bound to follow him, as Stephens certainly did not know *C. angustatum*, *Er.*, as a *species*, though he may have had it to represent his ferrugineum. If, indeed, only one form had been found in this country, there might be more show of reason; but we have certainly two red species, if not more, which Stephens failed to recognise.

Monotoma angusticollis. — The above change is adopted from Thomson, who shows that Aubé mistook Gyllenhal's

species. M. Thomson has revived Dejean's applicable name for the old *angusticollis*.

Læmophlæus pusillus. — This species is a purely warehouse insect, and does not appear to have naturalized itself like its congener, *L. ferrugineus*. It should therefore be transferred to the end of the list. The same remark will apply to *Silvanus advena*.

Cryptophagus. — Some of the species brought forward in my former Catalogue were introduced as examples so named by continental Entomologists, not in all cases with sufficient accuracy. Thus *C. subdepressus* corresponds with *C. affinis*, *St.*, according to the specimens in Mr. Bold's collection, named for him in Paris. Mr. Janson had also represented this species by an immature *C. affinis*. *Paramecosoma Abietis* appears not to be known as yet in this country: it is very common at times in the "Landes," and might not improbably occur at Bournemouth or other pine localities; it is a constant guest of the gregarious larvæ on the pine, especially *C. processionea*. *Cryptophagus grandis* is a very good and distinct species, unlike any other. *C. fuscicornis* was founded on an extreme variety of *C. dentatus*, but Mr. Rye informs me that he has met with what he considers to be the true species.

Atomaria nana. — The evidence so carefully adduced by Mr. Wollaston is enough to throw over Stephens's name. The description is admittedly worthless, and out of nine specimens five were placed under other names! To supersede, on such grounds as these, the accurate and minute description of Erichson, is more than is likely to be admitted by any that use his works.

Ephistemus gyrinoides. — Wollaston pointed out the correct synonymy of this genus in 1854. Our common insect is the ovulum, *Er.*, and no doubt *E. gyrinoides*, *Marsh.* The true globulus, *Pk.*, is much rarer, and is considerably smaller and differently shaped; the thorax, moreover, being simply emarginate in front, instead of bisinuate.

Lathridius angulatus. — Specimens of this insect, named by Count Motschulsky, the author of the species, are now before me. It is very close to *L. angusticollis*, but differs materially in the form of the anterior angles of the thorax; and as yet I have seen no gradation.

Lathridius elongatus.—I have frequently received specimens of this from the Continent, and always with the name "*clathratus*." From a comparison of the characters given in Mannerheim's work I cannot but suspect they are identical; but I have one example differing a good deal from the normal form of *L. elongatus*, which may be the other species.

L. consimilis.—This species is abundantly distinct by its quadrate thorax, the angles not being at all dilated, and the broad smooth interstices of the elytra. I have only seen two specimens in Mr. Matthews' collection, one of which he kindly ceded to me.

Corticaria ferruginea, *Msh.*—This change of name is requisite, as Marsham's description clearly applies to the commoner of our two insects; indeed the *C. ferruginea*, *Gyll.*, is very rare in this country, and always of a dark chesnut-colour.

Byrrhus dorsalis.—Here, as elsewhere, the names of Forster, long ago pointed out by Stephens, should be restored: he was the earliest English writer who described species in a reasonable manner, and some of our patriotism would be well employed in vindicating his claim to priority.

Saprinus punctulatus, *Thoms.* iv. 242. — This species is much smaller than even the smallest *S. rotundatus*, and has no trace of the sutural stria. I have only one specimen, confused with *S. rotundatus*.

Paromalus pumilio.—Stephens's name, besides coming into collision with *14-striatus*, *Gyll.*, is posterior to Erichson's by five years.

Aphodius niger, *Pz.*—This species is very close to *A. plagiatus*, *L.*, but is of a deep black, without any æneous tendency. The metasternum is sparingly punctured and glabrous in the male, the reverse being the case in *A. plagiatus*. Of course it is only with the unicolorous varieties of this latter that it could be confused.

A. pubescens, *St.*—This species nearly resembles *punctatostriatus* and *prodromus*, and so perhaps has been overlooked hitherto. It has the sides of the head broadly ochreous, as in the recently-discovered *A. obliteratus*, and has the metasternum impressed and pubescent in the male. These three species are much alike in external appearance; but the sexual characters readily separate them. Thus *A. prodromus* has

the metasternum hardly depressed and smooth, and the spur of the anterior tibiæ obtuse; in punctato-sulcatus the metasternum is abruptly depressed, but still smooth, while in pubescens it is hairy; the tibial spur being acuminate in both cases.

Rhyssenus.—Nothing appears to me more likely than that our coast species of this group have yet to be increased, especially towards the South-West of England. Two or three are recorded from Cornwall, though as yet on questionable evidence. They are to be obtained at the roots of grass, &c., on the sand-hills.

Anomala Donovanii.—The specimens preserved in the British Museum are simply a North-American species, *A. binotata*, *Burm.*, as Mr. Smith pointed out to me on a recent visit. As these are alluded to as types by Stephens, the species will probably sink, but it was described on specimens from Donovan's collection.

Cryptohypnus maritimus, *Curt.*—*C. scotus*, *Cand.*, is only this species. Candeze appears to have re-described it on a type sent him by Wollaston.

C. dermestoides.—The commoner species in this country is the 4-guttatus, *Lap.*, from which the dermestoides may be known by its immaculate elytra and dark base to the antennæ. It is a little doubtful whether they be specifically distinct, but the balance of opinion is certainly in favour of it.

Cardiophorus thoracicus.—It seems doubtful whether this species is really British, yet Fabricius described it from a British example in the first place. Mr. Wollaston's specimens from Cambridge were all *Megapenthes sanguinicollis*.

Melanotus niger.—If the name *niger* be retained for the *Athous*, it cannot be kept here also; hence the next earliest name must be used, which happens to be one given by a countryman of our own in the 'Zoological Journal.'

Ctenonychus.—This generic name of Stephens's is revived, as *Synaptus* is preoccupied in another branch.

Microcara Bohemanni, *Mannh.*—This species differs from *M. livida* by its smaller size, less evident costæ on the elytra, and the raised margins of the thorax. I cannot, however, help thinking that it will eventually be found to be a mere state of *M. livida*. Hitherto I have found it much rarer than the type,

Cyphon coarctatus, *Pl.* — This species, known by its raised costæ, has been subdivided with success by Thomson; MM. Kiesenwetter and Mulsant have also recognised these species, the former adding one to their number. They group naturally into two divisions; one with the punctuation equal, including *coarctatus* and *nitidulus*; and the other with a close thick punctuation round the scutellum. Of these *C. fuscicornis* and *C. pallidiventris* closely resemble each other, but the former is much darker and more thickly punctured. *C. macer*, *Ksw.*, not yet found here, is much smaller and entirely testaceous, the form being very elongate.

C. nigriceps, *Ksw.* — This species resembles *C. pubescens* in its absence of raised costæ, but differs by its smaller size, more shining appearance, and the acute posterior angles of the thorax. If all these species were collected from several localities, some idea of their probable specific value might be obtained. They do not at all require setting, and are much more likely to be perfect if just mounted on as small a piece of gum as possible: in fact we quite ruin the mass of our insects by clogging the antennæ and tarsi with gum; a single small point of liquid glue underneath holds much better.

Telephorus lituratus. — The Linnean description of *rufus* is too brief for identification, and the specimens in his collection correspond with *Hylecætus*; hence, in the doubt, the expressive name of *Fallen* may be retained for it.

T. lateralis, *L.* — The general consensus of authors is in favour of retaining this name for the *T. oralis*, *Germ.* Erichson tried to show that he meant the *Podabrus*, but without success; no specimens, unfortunately, exist in his collection; but here, as subsequently in *T. melanurus*, the Linnean name must be retained for one or other of the disputed species, not, as some would do, for both.

T. translucidus. — The name *T. unicolor*, *Curt.*, though the oldest, is preoccupied by *Faldermann*.

T. fulvus. — That *Linneus* meant *Ischnomera*, and not *Telephorus*, by his description, there can, I should think, be no doubt. Both exist in his collection, but the *Telephorus* has a very suspicious appearance, while the others seem typical enough.

T. limbatus. — Notwithstanding that the Linnean description applies to *T. testaceus*, as now defined, *all* his specimens correspond with *limbatus*, *Thoms.*

Anobium.—The old genus *Anobium* has been considerably subdivided by recent authors, and not before it was necessary. M. Motschulsky first indicated some of the groups, and then MM. Mulsant and Thomson made various others, almost simultaneously, the priority remaining with M. Thomson. *Anobium* is here restricted to the punctate-striate species, which even then differ in a manner almost generic among themselves. The species of *Ernobium* (Thomson wrote *Ernobius*) are very numerous, and more will occur in this country. All have the same red-brown colour and facies, differing principally in the proportions of the antennæ. Our common one has the fifth and seventh joints of the funiculus evidently longer than the others, and is probably the consimile, *Muls.*, but he seems to have applied the name of *molle*, *L.*, to a species not found in Sweden!

The *Lasioderma testacea*, *Steph.*, an insect infesting tobacco, has been for some time referred to *A. serricorne*, *Fabr.*, and formed into a genus by Guérin, but it enters naturally into *Pseudochina*, *Duval*. It appears to have received the name *testaceum* from Duftschmidt in 1825.

Coenocara.—This new genus was established on *C. Bovistæ*, in 1858, by Thomson. It has nine joints only in the antennæ, and has the eyes very irregularly shaped, being almost divided. Mulsant re-created it in 1864, under the name of *Euneatoma*.

C. Bovistæ.—Mulsant has changed this name to *C. subalpina*, *Bon.* 1812; why, he does not say. *C. Bovistæ*, *E. H.*, dates from 1803, and seems well founded.

Anitys.—This genus was formed by Thomson in 1863, about a year previous to the *Amblytoma* of Mulsant. It is distinguished by the very short eight-jointed antennæ, and several peculiarities of structure.

Cis.—Some of the divisions of this genus appear to differ only in the number of joints of the antennæ, which is hardly a generic distinction, especially when, as here, the relative form is preserved, one joint being dropped. *Octotemnus*, however, further differs in its tibiæ and other structural points.

C. rugulosus.—This species is intermediate between *C. Boleti* and *C. setiger*.

C. hispidus.—Thomson has, as I conceive rightly, united this to *C. micans*, *Hb.*; they are often difficult to separate,

and the difference is only that the punctures are more serially disposed in *C. hispidus*.

Cis punctulatus.—I have referred to this species, with doubt, two examples of a *Cis* that cannot belong to any other, but which differ materially from the descriptions given. It is as elongate as *Alni*, and very distinctly punctured and clothed with longish hairs.

C. festivus.—The brief descriptions of Mellié are very unsatisfactory, but we have at least two or three new ones allied to *C. festivus*; one is probably *bidentulus*, *Rh.*, but I cannot speak with certainty.

C. Jacquemartii.—This species comes very near *C. nitidus*, of which it has exactly the punctuation. It may be known by its dark, nearly black colour, and by the anterior angles of the thorax being obtuse, and not produced as in *C. nitidus*.

Errata.—Page 112, line 1, for “*Hydræna*” read “*Hydrobius* ;” line 32, for “*comparison*” read “*confusion*.”

(To be continued.)

G. R. CROTCH.

University Library, Cambridge.

Life-history of Chærocampa Elpenor.—The eggs are laid singly at the end of June, on the leaves of *Epilobium hirsutum* (willow-herb) and *Circæa lutetiana* (enchanter's nightshade); also, in London gardens, on the several varieties of *Fuchsia*, on which plant the larva will feed greedily in confinement: the larva emerges during the first or second week in July, and is full-grown by the second week in August, feeding for about one month. The full-grown larva rests on the twigs of the *Fuchsia*, stretched at its full length, and holding by the third pair of legs, as well as by the ventral and anal claspers; the head is bent under, touching the twig: the *Sphinx* attitude is not assumed: viewed from the front the resemblance to a pig's head is very striking, the head of the larva representing the flattened disk of the pig's snout, and two ocellated spots on the 4th segment the pig's eyes. Head remarkably small, partially received into the 2nd segment; the face flat, the crown undivided: body

attenuated anteriorly, the 2nd and 3rd segments being very small, the 4th much broader and stouter, the 5th rather the stoutest, the rest uniformly cylindrical, the 12th bearing a short dorsal, scabrous, slightly curved horn, directed backwards. General colour of head and body either dark velvety umber-brown or velvety oil-green; in either case the dorsal area is reticulated with darker brown, almost black, markings: on the anterior margin of the 4th segment are two ocellated black spots, and on each side of the 5th and 6th segments is a larger, almost circular, and very ornamental black spot, containing near its upper margin a reniform white spot, the upper margin of which is convex; the centre of this white spot is clouded with smoke-colour; the ventral is much darker than the dorsal area, and on the thoracic segments is a lateral, paler, not very clearly defined stripe, which ascends towards the ocellated spot on the 6th segment: legs pale; claspers concolorous with the ventral area. Towards the end of August these larvæ descend to the surface of the ground, and there, spinning a slight web, change to pupæ, and in that state remain until the following spring, when the moth appears on the wing. The surface of the pupa is slightly scabrous, with a keel-like case to the oral organs, and a broad, flattened, deltoid, pointed, slightly incurved horn on the 12th (now the terminal) segment.—*E. Newman.*

Entomological Notes and Captures.

Dianthœcia cæsia, var. *Manani*, &c. — Mr. Parry says (Entom. iii. 116) he now finds the specimens he took are *Dianthœcia cæsia* of the continental list, and thinks they "ought to retain that name," &c. Having seen some of the specimens he sold to Mr. Hodgkinson, and also a fair sample of those he sold to Mr. Carter, I wish to say he can have no idea at all what my *var. Manani* is like, his being all poor faded specimens, and the males might do duty for several continental species I know; whilst my first brood is a dark blue lead-colour, with a few yellow patches, without perceptible striga or stigmata; the later specimens being typical of *cæsia*. To say the first or *Manani* form were *cæsia* required a thorough knowledge of continental moths, which I have

not, and therefore deferred to Mr. Doubleday's judgment ; but anyone having seen typical continental cæsia could tell later specimens, when fine, were cæsia at a glance, as they are not *blue*, but suffused whitish, with a darker central fascia, the stigmata well defined, and a row of dots outside the fascia, &c. It is only because I took and bred above twenty specimens, with little if any variation amongst them, in May, and quite as many of the typical form later in the season, that I ventured to give the permanent variety a name ; and however much I may regret having done so, for Mr. Parry's sake I must tell him it was named long before he visited the Isle of Man in June. The variety being permanent, the name must be used when speaking of it, just as, in speaking of *Pieris Napi* from the Swiss Alps, we say *var. Bryoniæ*, *God.*, or of *Anthocharis Sinapis var. Erysimi*, *Bork.*, or *var. Diniensis*, *Bdv.* ; or as, now I have been so fortunate as to obtain specimens of *Vanessa Urticæ* from Hawkshead, North Lancashire, without the two outer discal spots (said to be ever present), we shall have to say *var. Ichnusa*, *Bon.*, the said form being common to Sardinia ; or perhaps I may give a better illustration from some beautiful specimens of *Vanessa Prorsa*, *Linn.*, given me by Mr. Doubleday : here we have the spring brood and summer brood so distinct-looking that until recently *Vanessa Levana*, *Linn.*, and *V. Prorsa*, *Linn.*, were never suspected to be father, mother, and their children ; the one brood (*V. Prorsa*) being the colour of *Limenitis Sybilla*, with a light band like that species has ; whilst the other (*var. V. Levana*) is the colour of a *Melitæa*, without the slightest yellow or whitish band through the wing, like its relative, but with a light mark on the costa, like *Vanessa Urticæ* ; whilst *V. Prorsa* at most has but a small spot so situated. The specimen of *Dianthæcia cæsia* exhibited at the Meeting of the Entomological Society by Mr. Bond seems to have been, like Mr. Parry's specimens, light-coloured, if I may judge by the specimen in the Bentleyan collection (said to be like those exhibited), which I remember well in Mr. Carter's collection doing duty as *Polia polymita*, perhaps twenty years ago ; it was afterwards given to Mr. Bentley by Mr. Carter, but I have no idea where it came from. It will be seen from this that I believe in the propriety of naming permanent varieties (as such) or races,

having or not having particular markings or colours ; and I regret Mr. Parry lost his chance to name this, simply because he never saw this form in the Isle of Man ; but, judging from the strange species I obtained there this summer, I have little doubt but he will be able to make up for it if he will collect there next year ; and it will give me great pleasure to have his assistance when I have again the misfortune to require a name for any of my captures, as I find it difficult to please everybody. My finest specimens of *Dianthæcia cæsia* were taken flying over the flowers of the sea-pink, which were just opening : this flower seems to be less attractive when fully in bloom, but the flowers of *Silene maritima* have always a charm for this species, as it deposits its eggs within them, but by the time it desires to deposit its eggs they are more or less wasted. My pupæ were found under the cushion-moss, which grows sparingly on the rocks, and in places almost inaccessible, even to an old cragsman. Three days devoted to pupa-hunting produced me about fifteen *Noctua* pupæ (from which I bred five *D. cæsia* and six *D. capsophila*, in fine condition), quite a number of *Tortrix* and *Crambina* larvæ and pupæ, and a few *Tinea* larvæ, from which I have since bred *Sciaphila Colquhounana*, &c., and last, but not least, *Gelechia leucomelanella*, *G. instabilella*, &c.—*C. S. Gregson ; Stanley, near Liverpool, August 14, 1866.*

Carabideous Larva killing a Canary bird.—I have to record a curious incident that occurred a few days since. A friend of mine had a hen canary sitting upon a nest of eggs : when going to feed it one morning as usual, she noticed it appeared ill, as it sat moping with drooped wings, and while she looked on, it fell from the perch to the bottom of its cage, dead : she took it out, and found a clot of blood on the back of its head, from which a larva partly protruded, which she took out and gave me ; it had eaten a hole completely through the poor bird's skull, and of course as soon as it penetrated the brain it caused instant death. Thinking the circumstances of the case rather singular, I take this opportunity of giving you notice of the facts just as I received them from my friend. I enclose the larva.—*T. E. Gunn ; Norwich, August 10, 1866.*

[The larva is certainly that of one of the *Geodephaga* : its

mandibles are very powerful, but its causing the death of a canary bird is most extraordinary.—*E. Newman.*]

Rare Coleoptera in London.—Mr. E. Waterhouse records, in the 'Entomologist's Monthly Magazine' for August, the capture of *Homalota hepatica*, *Calodera umbrosa*, and *Deleaster dichrous*, in the courtyard of the British Museum.

Eupithecia constrictata in Ireland.—Mr. Birchall, in the copious list of the names of Lepidoptera occurring in Ireland (*Ent. Mo. Mag.* iii. 59), makes the following addendum to that of *Eupithecia constrictata*, "Generally distributed and common." This insect is so rare that I have never seen a really good specimen: is my friend Birchall quite sure of the species?—*E. N.*

Lithosia caniola.—In the same list Mr. Birchall writes of *L. caniola*, "On one point of the Irish coast, and in no other part of the British Islands." Mr. Doubleday (*Ent. Mo. Mag.* iii. 67) observes that the first British specimens of *L. caniola* he saw were in a box of Lepidoptera which Mr. King assured him were all taken near Torquay. This view of the case corresponds with my own, and I shall wait anxiously for my friend's explanation.—*E. N.*

Sisyra Dalii and *S. terminalis* near Reigate. — Mr. McLachlan records (*Ent. Mo. Mag.* iii. 68) the capture of these two species, by beating the bushes on the banks of the River Mole, in Surrey, on the 6th of July.

Cryptocephalus 10-punctatus in Staffordshire.—Mr. Garneys records, in the 'Entomologist's Monthly Magazine' for August, the capture of four specimens on birch, in Staffordshire.

Food-plant of Callimorpha Hera.—I have taken the liberty of writing to ask you if you will have the goodness to tell me what the larva of *C. Hera* feeds on. A female I have taken has laid some eggs, and I should much like to rear them.—*Evan John; Jersey, August 10, 1866.*

[Hübner figures the larva of *Callimorpha Hera* on *Cytisus scoparius* (broom), but Boisduval says that, like *C. dominula*, it is a general feeder, eating *Cynoglossum officinale* (hound's-tongue), *Myosotis* (mouse-ear), broom, currant, &c.—*Edward Newman.*]

The Larva of Saturnia Carpinii has fourteen segments.—Have you remarked that all the drawings of the caterpillar

of the *Saturnia* (not even excepting your own beautiful sketch) have made it a segment too short? I send a sketch, taken from life last week, to show you what I mean. — *F. H. Battersby*; *August, 1866.*

[The admirable drawing sent by Mrs. Battersby has thirteen very obvious segments, besides the head and a small segment bearing the anal claspers.—*E. Newman.*]

The Turnip-grub a Food of the Lapwing. — I should feel greatly obliged by your telling me the name of the caterpillars herewith sent: they were taken from the stomachs of two lapwings shot as they rose out of a turnip field. The grub has injured the turnip crop for the last two years, and the lapwings must by feeding on them do a vast deal of good.—*W. E. Beckwith*; *Wellington, Salop.*

[The larvæ are those of *Agrotis Segetum*, which I described at length in the 'Zoologist' for 1865, p. 9545. I am much pleased to find that beautiful bird the lapwing thus establishing a substantial claim to our protection.—*E. Newman.*]

Answers to Correspondents.

F. S. A. — The insect forwarded to me is the winged male of the garden ant (*Formica nigra*); the swarms you speak of are not extraordinary: it is the economy of this as well as many other ants for the winged individuals, both male and female, to appear simultaneously and suddenly, at this season or a little later. In September I have seen "countless thousands" floating on the surface of the Thames between London and Gravesend; a strong northerly wind was blowing, and the ants appeared to be continually arriving from the Essex coast, and joining their companions in a watery grave.

Bee. — The bee is *Melecta armata* of Smith's 'Catalogue of the Bees of Great Britain,' the *Apis punctata* of Kirby's 'Monographia Apium,' and *Melecta Clotho* of my Monograph in the 'Entomological Magazine.'

Cynips. — The galls sent by "Cynips" are those of *Cynips lignicola*: I know of no artificial remedy, but the blue titmouse is a natural one: in the woods of Herefordshire the galls and their natural enemy are equally abundant.—*E. N.*

THE ENTOMOLOGIST.

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[PRICE 6D.

Revision of the ' Catalogue of British Coleoptera.'

By G. R. CROTCH, Esq.

(Continued from page 127).

Tomicus. — The recent researches of MM. Eichhoff and Chapuis have shown the necessity of subdividing this genus. The sections thus established differ principally in the parts of the mouth, and must be maintained as genera on any consistent principles.

Cryphalus Abietis. — It has been recently shown that this species is identical with *C. asperatus*, *Gyll.*, which name it will have to take.

Dendroctonus, *Erichson*. — The type of this genus is *D. micans*, the finest of the European species of this group, and one not hitherto found in England.

Hylastes rufus, *Marsh.* — This name has been restored, as far earlier than *Gyllenhal's*, and as being recognizably described, more so in fact than the generally received *H. obscurus* (*Trifolii*, *Müll.*)

Baris Abrotani, *Germ.* — The name "*picicornis*," used for this insect by Walton, seems to be hardly desirable. It is certain that *B. Abrotani* and *B. Lepidii* were confounded, and, from their relative distribution, probably the latter was the type: certainly Stephens had *B. Lepidii* in view. Hence in the confusion it will be best to ignore the name "*picicornis*."

Ceuthorhynchus versicolor. — This species has only six joints in the funiculus, as remarked by Thomson, and differs in that respect from the true *quercicola*, *Fabr.*, which has seven, and is consequently a true *Ceuthorhynchus*.

C. pallipes. — Under this name I have intended to designate the curious variety found hitherto only on Lundy Island by Mr. Wollaston. It resembles *C. contractus* in all

particulars, but has perfectly pale legs, and is certainly quite mature, several specimens having been captured.

Ceuthorhynchus suturellus, *Schh.*—Four or five specimens standing in Mr. Clark's collection were carefully compared with Schönherr's type for me by M. Brisout. Notwithstanding therefore certain discrepancies pointed out to me by Mr. Tylden, I have retained this name for the species in question.

Acalles turbatus. — *A. misellus*, *Schh.*, is only a small and ill-marked variety of *A. turbatus*, which name should be retained.

Cionus hortulanus, *Marsh.* — This species was sunk by Walton, but has been retained in the European Catalogues. I have only seen a description of it in Thomson's work as yet, but it is sufficiently distinct, and is much commoner than the true *C. Thapsus*. This latter insect is greener, and has the black spots on the suture very unequal in size. In *C. hortulanus* the female has the rostrum smooth and attenuate.

Tychius.—This genus is as yet in great confusion. M. Brisout informs me that he contemplates a revision of it with the Schönherrian types. I have here followed the nomenclature of his little tabulation of the French species, published in the 'Annales.' *T. polylineatus* must be regarded as new to our fauna, the *polylineatus* of Waterhouse being what M. Brisout calls "lineatulus," a name which cannot however be retained. *T. junceus*, *Walton*, corresponds with *T. curtus*, *Bris.*, the true *junceus* not occurring in this country. The ochreous-scaled *T. Kirbii*, *Waterhouse*, generally known as "flavicollis," is certainly the "squamulatus, *Schh.*" Comparisons with type specimens show also that *T. nigrirostris* corresponds with *tibialis*, *Schh.*, as had already been suspected.

Acalyptus rufipennis. — Of the two species given by Schönherr, ours is certainly referable to the smaller and paler one. *A. Carpini* is larger, and always clothed with silvery scales, whereas *A. rufipennis* is not unfrequently rufescent.

Magdalinus barbicornis. — Dr. Power possesses specimens of this species, and I have seen examples in other collections. It is near *M. Pruni*, but the singular antennæ of the male at once characterize it.

Byctiscus.—This genus, proposed by M. Thomson, appears to be well founded, and is accepted by Lacordaire and others.

Rhynchites uncinatus, *Thoms.* — This species has been separated from "nanus" by Dr. Power for some years, in his collection, but had not been described until M. Thomson also discovered it in Sweden. It is not rare; in fact is in the South commoner than the true *R. nanus*, from which it is to be known by its larger size, strigose rostrum, rugulose punctate thorax, and hooked tibiæ.

Bagous. — The indigenous specimens of this genus need a further revision. The Monograph of M. Henri de Barneville suppresses one of our species, *B. limosus*, *Schh.*, but I cannot think in that case that ours are correctly identified. We have certainly *B. subcarinatus*, *Schh.*, a species near *B. Frit*, but distinct; and probably several others. I have restored Herbst's name to *B. lutulentus*, partly as being anterior and partly to avoid the confusion of names.

Procas Steveni. — Mr. Wollaston's remarks in his 'Coleoptera Atlantidum' accord perfectly with the views of several continental Entomologists; and I do not doubt that our two insects are only extreme forms of one and the same species. Marsham's name, though far anterior, is unfortunately preoccupied; hence Schönherr's must be used.

Larinus ebenus. — The priority of Marsham over Olivier does not appear to have been noticed: it comes into play in three or four instances.

Hypera elongatus, *Payk.* — One specimen, among numerous *Hyperas* forwarded to M. Capiomont, was returned with the above name. The insect occurs in Sweden, and is not an unlikely species to occur here; but I have no note of its exact capture. It is very close to *H. suspiciosus*, but the tibiæ in the male are much more strongly hooked, and the whole insect is much more elongate.

H. Julini, *Sahlb.* — Stephens regarded this as a species, under the name of "alternans." M. Capiomont, who is engaged in a revision of the European species, informs me that he finds it always separable by constant structural characters. Its appearance is certainly very different.

H. trilineatus, *Msh.* — This species has generally escaped notice abroad, but it is widely spread over Europe, and has been re-described under several names. It is very distinct from *H. nigrirostris*, with which it has at times been confounded.

Otiorhynchus fuscipes. — Without entering into the question of whether we have Stierlin's *O. fuscipes* or not, I can only say we certainly have two very distinct species, which differ considerably in their respective sexes, and are never, I believe, found in company. One of the best marks of distinction is furnished by the striæ on the anal segment of the male, which are close and even in one and coarse in the other.

Sitones longicollis, *Schl.* — M. Allard, to whom I submitted my series of this genus, pointed out two or three of the above species which had been overlooked. It is closely allied to *S. flavescens*, and its differences have been pointed out by Mr. Rye in his extract from M. Allard's Monograph.

Strophosomus melanogrammus, *Forst.* — Forster was nearly the first author who described English insects, and did so moreover in a most satisfactory manner. All his names ought to be restored carefully, both for English and American species.

Barynotus Schönherri, *Zett.* — This species has been overlooked in this country, and confounded with *B. obscurus*, which it closely resembles. It is, however, much less densely scaled, the rostrum and thorax being nearly bare; the scales on the elytra also are partly metallic, and the whole insect is smaller.

Zeugophora Turneri. — I cannot see that this insect differs structurally from *Z. scutellaris*, *Suffr.* It is, however, a very curious and constant variety, and was found by Mr. Sharp and myself in Ross-shire this summer. The type form of *Z. scutellaris* has not been detected in this country, but varies in having the head red or black (*Z. frontalis*, *Suffr.*)

Lema Erichsoni. — All the specimens I have seen of this species, except some in Mr. Wollaston's collection, belong to *L. melanopa*, and represent a very curious form of that insect, hitherto unnoticed, and which is concolorous all over. The true *Erichsoni* more closely resembles *L. cyarella*, but is more elongate and differently punctured. Mr. Wollaston had determined these at least ten years ago.

Cryptocephalus violaceus, *L.* — An old specimen, without locality, is extant in Dr. Power's collection. It is not an unlikely native.

C. fulcratus, *Germ.* — Mr. Baly has kindly drawn my

attention to the fact that we do not possess the true *C. flavilabris* in this country. There would seem to be a number of blue species closely allied, and we may yet add to our list in this genus.

Cryptocephalus vittatus, *Fabr.* — Specimens are extant in several old collections, but, like *Onthophagus Taurus*, I believe all came originally from Jersey.

C. Querceti, *Suffr.* — Two specimens of this species were taken by the Rev. A. Matthews, one I believe in Sherwood Forest. It is only like *C. frontalis*, from which, however, the absence of the yellow markings readily distinguishes it.

(To be continued.)

G. R. CROTCH.

University Library, Cambridge.

Life-history of Sesia bembeciformis. — As this is a most injurious species to our black poplar growers in South Lancashire and the adjoining low lands of Cheshire, and also to the willow and osier growers in the same districts and in other places in the North of England, it has a claim on our attention; and though some of our entomologists may know a little of its history, it may be that a life-history, given by one who has made injurious insects his study, may please if it does not instruct his friends. The eggs are deposited in June and July in the bark of *Populus nigra* (black poplar), the only species of the genus obnoxious to its attacks, and upon the various species of *Salix* (willows and osiers), without any regularity, sometimes a few here and there, and at other times a whole batch are laid in a solid mass; they are of a reddish brown colour: they hatch in a few weeks, and the young larvæ spread themselves over the surface of the bark, searching for a crack in which their juvenile mandibles can make perforations: once fairly under cover they seem to rest for a few days, and they then enlarge the hole, and, going deeper and deeper, they reach the inner bark of the smaller trees, where they remain eating the bark and sapwood until autumn, when they have attained a length of about three lines; they then penetrate the timber, and about the following June they throw out much frass from an oval

aperture: at this season of the year these larvæ may often be seen crawling about on the surface of the bark, or making a new hole for again entering into the interior: in the January following they can only be found by cutting deep into the tree: they then eat voraciously, as may be known by the quantity of frass which may then be observed on any projection of the trunk that happens to have caught it in falling, or on the ground at the foot of the tree: a non-entomological observer may well suppose this to be sawdust, which by some inexplicable means has got lodged in all manner of impossible, or at any rate unlikely, places, but, so far as my experience goes, rarely exceeding a height of ten feet from the ground, even in the largest trees: at this period the larva generally eats upwards; a little later it returns, and widens its burrow here and there; and eventually eats its way to the outer world, leaving only the thin outer cuticle of the bark, and then, reascending its old burrow, about April it spins a strong white silken cocoon, and makes up therein. [The full-fed larva is about an inch in length, nearly cylindrical, but having a manifest lateral skinfold; the head is corneous, glabrous, porrected, and very manifestly narrower than the 2nd segment, into which it is sometimes partially received; the 2nd segment has a glabrous dorsal plate; both the head and body emit a few scattered bristles. Colour of the head and 2nd segment testaceous-brown; of the body creamy white, the spiracles dark brown, but small and inconspicuous: after completing its cocoon it remains during the winter in a state of repose, neither changing to a pupa nor attempting to make its escape, but in May it becomes a pupa, which at first is of a creamy white colour, but by degrees becomes testaceous-brown: the case covering the head is produced into a frontal point; the eyes are very prominent; the cases of the wings are short; the cases covering the middle and hind legs are free at the extremities, those of the hind legs exceeding the wing-cases in length; the dorsal area of the abdomen has two transverse series of scabrous points on the 1st, 2nd, 3rd and 4th segments; the first of these two series has larger, longer and more pointed teeth or serratures than the second: neither of the series is continued on the ventral surface of the segment: the object of this armature is to enable the pupa by a wriggling movement to make its way, after it has escaped

from the cocoon, to the aperture previously prepared for the escape of the moth.] This event takes place in June, when the pupa pushes its way out until it projects half-way: here it appears to rest for a few minutes, and then, if the sun shines, it seems to jump from its chrysalis-case, shake itself, and, if a male, flies away; but if a female it often obtains a mate before its wings are dry: on fine mornings the moths emerge from the pupa between 7 and 9 A.M.; in cloudy weather a little later: it will thus be seen that this species takes at least two years to complete its metamorphosis, and from experiments now partially carried out I incline to think they sometimes remain still longer in the larva state. The figure given in Westwood and Humphrey's 'British Moths and their Transformations,' vol. i. pl. vii. fig. 15, from Lewin's plate, Coll. Lin. Soc., represents a physical impossibility, and would lead one to suppose that *Sesia bembeciformis* laid in pupa without a cocoon: in the first place, the passage for the exit of the pupa, which always projects from the aperture before the perfect insect bursts from it, is depicted not half the size of the pupa inside,—hence escape would be impossible; and secondly, the pupa, or rather a pupa, for it is certainly not that of a *Sesia*, is represented naked, whilst our insect invariably constructs a tough cocoon of strong white silk, which is covered on the outside by the frass or sawdust already mentioned, thus giving to the cocoon a brown appearance outside. From experiments made upon trees in my garden, I found them all in a decaying state eight years from the time I placed the eggs of this insect on them; but by cutting fairly into the tree wherever frass was thrown out, and extracting the larvæ, I so far recovered one tree, *Salix viminalis*, that it now serves me to feed those larvæ in my breeding-jars which require that kind of food; and larvæ which I have introduced are now throwing out frass from this tree as freely as if the eggs had been laid by the parent on the bark. In order to assist the larvæ to enter the wood I bored, with a gimlet, a number of holes, into which they entered with great readiness. Our poplars and willows (two valuable trees for clogmakers, wheelwrights and wireworkers) being so subject to injury from *Sesia bembeciformis*, we ought to set boys, for about two weeks in summer, to gather the pupa-cases as they project from the trees before the moth

emerges, or to kill the moth as it sits upon the tree before it takes its first flight, and then our trees would be comparatively safe; or if we encourage the blue tit and the common creeper they will do the work for us equally well. [There is something very remarkable in the manner in which the larva of this species appears to poison or destroy the tree on the wood of which it feeds, when it has prepared a place of exit; the bark surrounding the future aperture loses its vitality for a certain space, and a distinct line, marking out an oblong area, becomes very perceptible; a few weeks subsequently a second area is marked in the same way, and shortly afterwards a third. I have specimens before me cut from a sallow which was killed by this larva, and which was presented to me by Mr. Pristo, of Whippingham; the inner cicatrix is about an inch long and three-quarters of an inch wide; the second in order is four inches long and two and a half inches wide; and the third, seven inches long and two and three-quarters inches wide; so it will be seen that the virus, whatever it may be, extends much farther longitudinally than laterally, the comparative longitudinal increase corresponding with the actual: dehiscence invariably takes place after the boundary-lines have once been mapped out, but it does not follow rapidly, weeks, and in some instances months, elapsing before the bark falls.]—*C. S. Gregson; Stanley, near Liverpool, August, 1866.*

[The additions in editorial brackets have been made by the kind permission of Mr. Gregson.—*Edward Newman.*]

Life-history of Arctia fuliginosa. — The eggs are laid in June and July, in batches of thirty to forty together, on the leaves of *Plantago major* (broad-leaved plantain) and several species of *Rumex* (dock), and the young larvæ generally emerge in ten or twelve days: the presence of these juveniles is indicated by numerous small and nearly circular holes in the leaf; this is particularly the case with lettuce-leaves, on which these larvæ feed freely in confinement; they always rest in a straight position on the under surface of the leaf: when touched, or when the leaf is shaken, they fall to the ground in a curved posture, and exhibit a decided tendency to assume the ring form, but almost immediately resume the ordinary straight position, begin crawling, and reascend the food-plant. In August, although still very small, they retire

towards the roots of the herbage, and there pass the winter, reappearing in April, when they grow much more rapidly than in the autumn, and are full-fed towards the end of May. Head subglobose, not much notched on the crown, highly glabrous, decidedly narrower than the 2nd segment, into which it is partially received: body very obese, the divisions of the segments deeply incised; the 2nd segment has a semi-circular, but not glabrous, dorsal plate, its anterior margin being truncate, its posterior margin convex and toothed; it is longitudinally divided by a pale median line; on each side of this segment there is also a depressed scabrous wart; the 3rd and 4th segments have each four scabrous warts, arranged in a transverse series; the 5th, 6th, 11th and 12th segments have sixteen warts each, two of them small, dorsal and approximate near the anterior margin of the segment, two still smaller and more approximate on the belly, and the remainder forming a transverse series of six on each side; the ventral warts are absent from the 7th, 8th, 9th and 10th segments, and on each of these a ventral clasper occupies the place of the lowest wart of the transverse series; every wart emits a fascicle of radiating bristles. Colour of the head pitchy red, the cheeks tessellated with paler: the body is smoke-coloured, with a medio-dorsal paler, almost yellowish, but rather inconspicuous stripe, interrupted at the incisions of the segments; there is also a transversely elongate spot of the same colour between the 4th and 5th warts, on each side of each segment; legs black and glabrous; claspers smoke-coloured, like the body, but slightly glabrous; bristles mostly pale brown, a few of them black. When full-fed the larva spins a somewhat boat-shaped cocoon of rather closely woven silk, interspersed with its own hairs, on the under side of a leaf or on some leaf-stalk, or on a blade of grass, and in this cocoon it turns to an obese black pupa, with a pale posterior margin to each abdominal segment; the thorax is dorsally very convex, the segments strongly marked, and the anal segment converted into an incurved horn. The moth appears on the wing in June. I am indebted to Mr. Greening, of Warrington, for a liberal supply of the larva of this insect.

Edward Newman.

Life-history of Scoria dealbata. — Eggs laid on various Gramineæ at the end of June; they are of a deep bright

orange-colour when deposited, but become almost black before they are hatched, which event usually takes place about the middle of July: the natural food of this Geometer is not known: the larva itself appears to be unknown to the lepidopterists of continental Europe: but young larvæ, the produce of eggs laid on a setting-board, feed freely on *Polygonum aviculare* (knot-grass); they continue to grow slowly until they are somewhat more than an inch in length, when they retire for the winter, concealing themselves among the stems of grasses, which appear to be their favourite resort. The larva now is long and slender, and rests on the knot-grass, attached by its claspers only, the body being held semi-erect; a slight bend occurs at the ventral claspers, and another at the third pair of feet, the intervening segments forming an elliptic arch; the head is porrected on a plane with the body, and the three pairs of feet are directed forwards, but not crowded together; when touched, shaken, or otherwise irritated, the anterior segments are bent downwards and contorted until they almost form a ring: I have continued the irritation until the larva has thrown itself angrily from its food to the ground, and there, after making various worm-like contortions, has assumed the form of a ring: on such occasions it soon reascends its food-plant, and then, attaching itself by its claspers, it waves its body about in a wild and dissatisfied manner. Head flat, porrect, exserted, of the same width as the anterior segments: body very slightly incrassated from the 4th to the 10th or 11th segment, transversely wrinkled, and having a longitudinal lateral skin-fold, which, by increasing the width of the larva when stretched at full length, gives it a slightly depressed appearance; the anal flap is deltoid, its apex terminating in a few bristle-like hairs, which are directed backwards. Head and body putty-coloured, striped longitudinally, the stripes varying only in intensity of colour: a dark and very narrow medio-dorsal stripe extends from the head to the tip of the anal flap; this is darker at the anal extremity, and is not perfectly uniform in width, but expands and contracts here and there in its course: this narrow stripe is intersected by a median, thread-like, paler stripe, so fine as certainly to escape observation without a lens: on each side of the medio-dorsal stripe is a paler and broader stripe, containing

a single series of intensely black dots, and being also longitudinally intersected throughout by two thread-like rivulet markings of a slightly darker hue; each of these pale stripes unites with the pale lateral margin of the anal flap; adjoining each pale stripe is a darker stripe of similar width, and this is longitudinally intersected by three paler thread-like lines. Of these the middle one is the most distinct: adjoining this is a paler stripe, comprising the skinfold and spiracles; this commences behind the head and terminates in the anal claspers: below the pale skinfold is a broader dark stripe, commencing behind the head and terminating in the ventral claspers; this also is longitudinally, but very indistinctly, intersected with paler threads: ventral surface pale, longitudinally intersected by three dark stripes, each of which is double, or again intersected by a median pale thread-like stripe; these three ventral stripes commence at the third pair of feet and terminate at the ventral claspers: legs and claspers with the same shade of colour as the body. After hybernation these larvæ begin to feed about the middle of April, and are full-fed by the middle of May, when each spins a delicate yellow shuttle-shaped cocoon, much resembling that of a *Zygæna*, and attached longitudinally to a culm of grass, in confinement selecting those which produced last year's seeds. The moth appears on the wing in June. I am indebted to Mr. Hammond, of St. Alban's Court, for this larva, and for many interesting particulars of its economy; and I must not conclude without referring to other previous descriptions, published by Mr. Stainton, at p. 117 of the 'Entomologist's Annual' for 1862, and by the Rev. John Hellins, at p. 190 of the third volume of the 'Entomologist's Monthly Magazine;' the latter reprinted at p. 230 of the Second Series of the 'Zoologist.' These entomologists did not succeed in rearing the perfect insect, and it will be remarked, by those who compare these prior descriptions with mine, that considerable discrepancies occur. — *Edward Newman.*

Life-history of Coremia ferrugata. — The eggs are generally laid on the stems of *Glechoma hederacea* (ground ivy), on the leaves of which plant the larvæ feed: the period in the egg state varies from ten to twenty days, according to the temperature, the cold east winds, which so frequently

prevail in the spring, greatly retarding their emergence ; the larvæ feed up very rapidly, the moths appearing on the wing at the end of May or in June, and these again depositing eggs ; a second brood is on the wing in August, but many of this second brood pass the winter in the pupa state, and the moths, appearing in the spring, deposit the eggs which produce the May brood of moths. The full-fed larva rests with the anterior extremity rigidly extended, but often in a slightly arcuate position ; when annoyed it tucks in its head, and rolls up the anterior part of its body in the form of the Ionic volute : the legs are crowded together, and closely appressed to the mouth. The head is prone, not conspicuously notched on the crown, and nearly of the same width as the body : the body is of nearly the same width throughout, and uniformly cylindrical, with the exception of a lateral skinfold which extends its entire length ; it is without humps, but, in common with the head, has a few small scattered warts, each of which emits a single small bristle. Head putty-colour, freckled with black on the face, and having a darker stripe on each cheek : colour of the dorsal area of the body, as far as the 9th segment, dingy brown, but this hue appears to be caused by the somewhat tessellated ornamentation ; this consists, in the first place, of a medio-dorsal stripe, narrow and almost thread-like on the 3rd, 4th, 5th, 10th, 11th and 12th segments ; on the 6th, 7th, 8th and 9th segments the medio-dorsal stripe is interrupted, and reduced to a median intensely black spot ; each of these black spots is surrounded by a paler area, dilated laterally, but attenuated at the extremities ; a dorsal series of lozenge-shaped markings results, as far as regards these four segments ; on each side of this dorsal ornamentation are three slender rivulet stripes, all of them sesquialterous or semi-double, but neither of them very conspicuous ; the ventral area, extending to and including the spiracles, is putty-coloured, but the spiracles themselves are intensely black, and surrounded by a paler area ; there is a medio-ventral pale brown or reddish stripe, containing three black spots, and extending from the 5th to the 12th segments ; on each side of this medio-ventral stripe the ground colour is extremely pale, and the pale part is bounded by a double sinuous darker stripe, very similar to those on the dorsal area ; this commences at the base of the third pair of legs,

and ceases at the base of the ventral claspers; this is again succeeded by a paler ground colour, and this again by a frequently interrupted and most irregular stripe, which contains five conspicuous black spots, and terminates in a larger linear spot close to the ventral claspers. The larva spins a slight web among the stolons of the ground ivy, and in this changes to a smooth brown pupa. (Compare *Coremia unidentaria*, described in No. 2 of the 'Entomologist.'—*E. Newman*.)

Life-history of Cidaria sagittata.—The eggs are laid in July, in little batches of three or four, on the partial stalks or flowers of the subcorymbose panicle of *Thalictrum flavum* (common meadow-rue), a plant which grows abundantly by the sides of some of the fen-drains near Chatteris, in Cambridgeshire; they are opalescent when laid, but become yellow before the young larvæ emerge, which emergence generally takes place during the first week in August. The young larvæ are at first orange-coloured, but soon acquire a more variegated appearance. They feed almost entirely on the seeds of the *Thalictrum*, but sometimes they also nibble round the partial stalks of the panicle, denuding them of their cuticle, and causing small white patches; and Mr. Fryer, to whom I am indebted for a bountiful supply of larvæ, as well as many particulars of their economy, informs me that in confinement they will eat the dried or withered leaves of *T. glaucum* or *T. aquilegifolium*, the latter a species very commonly cultivated in gardens, and remarkable for its abundantly floriferous panicle, so attractive to the beautiful rose-beetle (*Cetonia aurata*) and other insects. Mr. Fryer has observed that if, when the larvæ have attained about half their growth, they are supplied with *Thalictrum glaucum*, they will bite half through the footstalks of the leaves, thus causing the leaf to droop and wither, and in this state they will feed on it as a substitute for their natural food, the seeds of *Thalictrum flavum*. In their progress towards maturity the larvæ undergo considerable change, the exquisite colouring of the full-fed larva being only acquired by slow degrees. They are full-fed in about a month, and then invariably rest with the back much arched, the head almost entirely withdrawn into the 2nd segment, the feet directed forwards, and the claspers tenaciously adhering to the slender flower-stalks of the food-plant. Head narrower than the 2nd segment,

highly glabrous, the face flattened, the crown slightly notched : body obese, deeply incised at the divisions of the segments ; the thoracic segments, namely, the 2nd, 3rd and 4th, are dilated at the sides, and the 2nd segment also in front ; the dorsal areas of these three segments unite in forming a shield ; the 5th, 6th, 7th, 8th, 9th and 10th segments have each a transverse dorsal ridge, very prominent and conspicuous, which terminates on each side in a kind of lobe or festoon, containing the spiracle : the ventral area has also gibbous projections, somewhat corresponding with those on the back, but proportionally less, in order to allow of the arched position in which the larva usually rests ; scattered over the dorsal area are minute warts, few in number and very inconspicuous in appearance ; each of these emits a small bristle. Colour of the head apple-green, the cheeks sparingly and inconspicuously irrorated with black : body apple-green ; the crest of each dorsal ridge is of a rich velvety oil-green, thus forming a series of conspicuous transverse bands, the interstices being pale apple-green ; the lateral lobes or festoons are in some specimens apple-green, but in others of a most beautiful rose-colour, and this again is bordered below by the most intense velvety black ; this black border descends into the anal, but not into the ventral claspers ; the dorsal area of the 10th and 12th segments is smoke-coloured, fading at the lateral margin into green, and then decorated with blotches of rose-colour : the spiracles are reddish ; the ventral area, legs and claspers are delicate apple-green : the hairs or bristles are black. At the end of August most of these larvæ spin up amongst the flowers of the food-plant ; others descend to the surface of the earth, and there change into short, obese, glabrous pupæ, having the head rather projecting and rounded ; the thorax very convex ; the wing-cases ample, and the anal segment very slender and horn-like, directed backwards, and bearing at its extremity two stout divaricating bristles. Colour of the head, thorax and wing-cases transparent olive-green, of the abdomen testaceous-brown. The moth appears on the wing in July. — *Edward Newman.*

Life-history of Cymatophora ridens. — The eggs are laid on the twigs of *Quercus robur* (oak) in April, and the young larvæ emerge in the beginning of June, and spin for them-

selves little domiciles for concealment or protection ; this is generally effected by curling the edge of a young and tender oak-leaf, and securing it in that position by a few silken threads : it continues to conceal itself in this manner, and appears to be full-fed by the middle of July : I took a great number on the 8th of July, 1864, beating them from the oaks in Birch Wood ; they fell into the umbrella without any covering, but, immediately it had the opportunity, each larva constructed a domicile for itself, generally fastening together two oak-leaves face to face, and allowing them to remain perfectly flat ; but in some instances I found that a larva had bent the tip of an oak-leaf backwards, and fastened it in this position in the manner always practised by the recently emerged larva : in either case the domicile was perfectly closed all round with silken threads : in this retreat it rests during the day, having the head always turned on one side, and the 13th segment with its claspers tucked in under the preceding segment : I have never seen one feeding by day ; at night it makes an opening in its dwelling-place, and devours the leaves within its reach, but never those of which its dwelling is constructed : sometimes a larva would appear to be very circumspect in what might be called keeping its seat during temporary absence, the anal claspers adhering to the entrance of its retreat, while the body was stretched about in all directions : at other times it would come completely out, and wander at random among the dwelling-places of its brethren ; in such instances it seems to lack the unerring instinct of the bee in returning to its own hive, for I have more than once seen two larvæ contending for the same retreat : in these contests one of the combatants often receives an unpleasant gripe, and its pale green blood issuing from the wound seems to impart cannibalistic propensities to the aggressor, for in these civil wars several larvæ were destroyed and partially eaten. The head of the full-grown larva is exserted, quite as wide as the 2nd segment, having very gibbose cheeks and a notch on the crown : the body is very flaccid and wrinkled both transversely and longitudinally, the latter more especially along the sides : the divisions of the segments are sufficiently obvious : a number of small but obvious warts occur on the body ; the 2nd segment is without these warts ; the 3rd and 4th have ten each ; the rest, as

far as the 10th, have eighteen warts each; six of these are arranged in a transverse series, reaching from spiracle to spiracle; two, not invariably present, are behind these; and five others are situated on each side below the spiracle. Colour of the head wainscot-brown, reticulated with dingy white; the colour is paler about the mouth, and this pale region has a black reniform spot on each side of the mouth, including the ocelli, which are also black; on each side of the face near the median division is a whitish line, which ascends to the crown, and then turns obliquely towards the anterior margin of the 2nd segment: colour of the body yellowish, the warts being white, and very frequently, that is in many of the specimens, surrounded by a smoke-coloured ornamentation, which imparts a decidedly different appearance to those specimens which possess it; the spiracles are wainscot-brown; the bristles from the warts are white; the legs and claspers are very pale, almost white. From the 8th to the middle of July I observed these larvæ spinning their cocoons in the still verdant leaves of the oak, and on subsequently examining these cocoons I found them very tough and compact, and each contained a smooth brown obese pupa, having a very pointed anal extremity, furnished with a series of minute hooks, by which it is suspended head downwards in the interior of the cocoon. From the circumstance of the perfect insect being almost invariably found on the trunks of the oaks in April, when they are perfectly denuded of leaves, it must be inferred that the falling leaves, acting as parachutes, carry with them in their descent the enclosed pupa, which, thus protected, remain on the ground until the moth makes its escape: in confinement this escape took place at the end of February and beginning of March, at least a month before the ordinary time in a state of nature. I have been indebted on two occasions to a kind correspondent, Mr. Mawson, of Cockermouth, for a supply of these interesting larvæ.—*Edward Newman.*

Life-history of Laverna atra.—Let us examine the fruit-spurs and terminal shoots of that somewhat gnarled and stunted apple tree as the leaves and buds are bursting forth: we find that the leaves, as well as the petals of the flowers, have the appearance of being scorched: on removing the spur at its point of issue, and carefully examining it, we find a

very small hole, with perhaps a little frass adhering to the outside: on dividing the spur longitudinally a burrow is found to have been made through the stem, and in the burrow a small, brownish, stoutish larva, with a dark head, is seen; this is the larva of *Laverna atra*; it continues feeding for some time, removing according to its fancy from one shoot to another, and invariably killing every one that it enters; it will also eat the leaves and flowers, and even the fruit when setting. If then we see a spur or shoot with the leaves brown, much curled and withered, and the petals reddish brown, incurved, and drooping, we may at once know this insect has been feeding thereon, and all such shoots should be removed at once. The eggs are deposited by the parent moth in July, and principally on the tops of young shoots, and no sooner are the young hatched than they bore into the shoot, completely arresting the growth of the tree, and causing it to assume the gnarled appearance already described. The larva is rather stout, grub-like, and of a brownish colour; the head narrow and dark-coloured; the corslet has a dark dorsal lunule; the first four or five segments are rather pellucid, with two distinct marks on the central segment; from thence the body is opaque. When full-fed the larva turns to a light brown pupa, sometimes on the tree, at other times on the ground: it remains in the pupa state from three to five weeks, the moth appearing on the wing in July. Here, then, we have one of the most injurious apple-tree feeders, which, eating the very vitals of the tree, can and does utterly destroy some of the choicest fruit grown in this district, while curiously enough some of the commoner kinds are but slightly injured. Espaliers suffer the most from this minute creature, which is snugly ensconced inside while our gardeners are dressing the roots or washing the trunk with white lime, or applying some secret nostrum of their own. The only way to prevent its injuring the tree, the remedy pointed out by its life-history, is careful summer and autumn pruning. Few gardeners could be induced to cut off the fruit-spurs; but as the eggs seem to be laid principally on the upper and lateral spurs, by cutting these from injured trees and burning them, the trees may be preserved and the insects kept in check. The perfect insect has the head, face and upper wings deep black, with two or

three raised tufts of deep black scales along the disk; hind margin sometimes grayish, but various in this respect, often oblique from the middle to the tip of the wing, with irregular markings near the posterior angle: hind wings dusky. Expands from $4\frac{1}{2}$ to $6\frac{1}{2}$ lines.—*C. S. Gregson.*

Entomological Notes and Captures.

Larval Poison and Parasites of Liparis chrysorrhœa.—Whilst watching a number of the half-grown larvæ of *L. chrysorrhœa*, which were busily engaged in forming a web to rest on while undergoing a change of skin, my attention was attracted by a curious movement by one of them. It had fixed itself firmly by the anal claspers to the side of the cage, and had bent over until the hairs on the back of the head and second segment touched the scarlet tubercles on the back, and by a side-to-side movement was apparently brushing some moisture from them, they being at the same time pushed out to the extent of half a line. With the assistance of a strong lens I could plainly see that an oily substance was exuding from them, and moistening a small space around. Thinking that most likely this had some connexion with the poisonous properties of this larva, I applied a small portion of it, with the point of a needle, to my wrist, and was surprised to find that I could, by doing so, produce the inflammatory swellings so well known to all who have handled the larva. Having killed some of them by immersion in spirits of wine, I made a careful dissection of them, and found that at the base of each tubercle was an orange-coloured gland surrounded by powerful muscles (but in no way connected with the breathing-apparatus), and filled apparently with an unctuous matter, which gave an acid reaction on litmus-paper, and when applied to the skin produced the results before mentioned. I applied other portions of the viscera in the same way, but always with negative results. This convinced me that these so-called valvular openings are, in fact, the sources from whence the poisonous fluid is supplied, and with which the hair of the larva is so abundantly anointed. That this family is poisonous above all others has been abundantly demonstrated, but for what purpose I am at

present unable to determine. Whilst making the above experiments, by the aid of a microscope, I discovered a number of parasites infesting the stomachs of many of the larvæ. When full-grown they were cylindrical in shape, white in colour, and had a cellular appearance. They evidently propagated by offshoots, as many had the young attached to them in different stages of growth. At first these were hemispherical; when more advanced, spherical. In the half-grown larvæ they were confined to the stomach, but in the more matured they occupied the whole of the intestines by hundreds. On many of the larvæ, which were suffering from diarrhœa, I found them in immense numbers, and the partially digested food in a state of fermentation. I have during the past summer lost at least nine-tenths of the larvæ of *Chelonia caja*, *C. villica*, *Liparis chrysorrhœa* and others, from this disorder; for instead of entering the pupa state they became mere bags of water. But perhaps the most curious part of the matter was that many of those that did become pupæ, instead of producing imagos, gave birth to a large crop of fungus, exactly resembling in appearance that figured by you in the 'Entomologist;' with this exception the tops of the upright shoots were light orange-coloured. Are these parasites of animal or vegetable origin, and are they identical with those known to infest the higher order of animals?—*H. Moncreaff; Southsea, September, 1866.*

Lithosia caniola in Ireland.—Being desirous of comparing Irish specimens of *Lithosia caniola* with English ones in my collection, I went to Howth on the 20th of August, making the 'Royal Hotel' there my head-quarters. After a right royal breakfast I set out to find *caniola* at home, taking the road by Badscallan to the Barley Lighthouse, a distance of about two miles: I descended the slopes to the cliffs on the Dublin Bay side of the Hill, or rather Hills, of Howth; and here, opposite the open Irish Sea, exposed to the full force of every storm from that quarter, without a shrub or a bush to shelter it (except here and there a few gorse), this fragile thing lives, and is evidently happy. I took it along the shore close to tide-mark, and upon the green slopes up to the table-land above, flying at dusk: by beating gorse-bushes and ragwort in the fields during the day I also secured a few specimens. The most productive place was

from the Lion's Head to the Needle Rocks, a glorious stretch of coast, cosey to work for a long distance. Most of the specimens obtained were much worn, but some were quite fresh, and on comparing these with specimens in my possession, from Cheshire, Devonshire, Norfolk, and continental Europe, I find little difference, the English ones being, if anything, smaller than the Irish or foreign specimens. I think I was quite three weeks too late for a good heavy catch, but was quite satisfied with fourteen specimens, the first day, for fourteen hours' work, and returned to my tea hungry and tired, but happy. — *C. S. Gregson ; Stanley, near Liverpool, August 30, 1866.*

Lithosia caniola and Dianthæcia capsophila near Waterford.—Seeing your note on *Lithosia caniola* (Entom. iii. 131), I wish to let you know that I captured the above insect at Namore, near Waterford, in August last ; also some very fine specimens of *Dianthæcia capsophila*. Specimens of both the above insects were sent to Mr. Birchall. — *Warren Wright ; Floraville, Eglinton Road, near Dublin, September 10.*

Eupithecia constrictata in Ireland.—In reply to my friend Newman's note (Entom. iii. 131), I do not think I have made any error as to this species, of which, however, I send examples, that he may judge for himself. I have met with it at Howth, at Galway and at Killarney, in considerable numbers, and think it may be correctly described as "Generally distributed and common in Ireland."—*Edwin Birchall ; Bradford, September 1, 1866.*

[I am much obliged for this prompt reply : I have no doubt my friend Birchall is right in the name.—*E. Newman.*]

Catocala Fraxini in the Isle of Wight.—I have again the pleasure of recording the capture of a fine male of *C. Fraxini*. It was taken at rest on the 13th inst., by a lady, in her flower-garden, who kindly presented it to me alive. It will, when dry, be placed in my collection. — *J. Prido ; Alerstone, Whippingham, Isle of Wight, September 14, 1866.*

Precocious Larvæ of Orgyia gonostigma.—Last year Mr. Clifford announced in your columns that he had succeeded in obtaining, during the summer, two broods of *Orgyia gonostigma* ; he sent me eggs from the later one, which I kept through the winter, but all proved infertile. Another correspondent, however, in the autumn of 1865, furnished me with

half a dozen juvenile larvæ of this insect, and being from a normal brood they of course hybernated, and in the spring of the present year produced four imagos, three males and one female: from these I obtained a batch of between four and five hundred fertile eggs: I determined to try, by a genial temperature and luxuriant food, also to obtain two broods. I had previously procured young oaks about a foot high, and planted them in large flower-pots: I cut the cocoon on which the eggs were deposited into pieces, and distributed them among the foliage, and as soon as the eggs changed colour I tied very fine gauze over the whole: in a day or two I found the outside covered with hundreds of minute larvæ; they had pushed through the fine meshes of the gauze. I carefully collected and returned them to the oak, but doubtless many escaped. On counting them over at a later date, when increased in size and requiring fresh food, I found upwards of two hundred and fifty remained. What I more particularly wish to report is that these larvæ, which in a normal state would now be in their hybernating costume, threw it off about the middle of August, and are at this time in full summer dress, having the anterior and posterior pencils of capitate hairs and the four dorsal tufts; under ordinary circumstances these appendages would not have appeared until next spring. The larvæ are now passing the third and last moult, and I fully expect (unless Nature performs some unforeseen freak in return for having been interfered with) that the transformation to pupæ will take place at the close of the present month, and that the second brood of imagos will appear about the middle of October. I shall in due time report the result.—*George Gascoyne; Newark, September 10, 1866.*

Economy of Hoporina croceago. — On the 11th of November, 1864, I happened to take an oak-branch, covered with dry leaves, from a hedge, and to my astonishment two specimens of this insect crawled out from beneath the leaves. Having a couple of boxes in my pocket, I quickly secured them: they were taken home and put into a cage in an out-house, with a portion of the resting-place they had chosen. Being anxious to know as much of their habits as possible, I visited them nearly every evening, and with great satisfaction. They were supplied with sugar in a sponge, but although they generally came out from their hiding-place on

mild evenings, I could not see them touch the sugar till the 5th of April, 1865. They rested by day among the leaves, and could scarcely be detected, so well does their colour match with the leaves. I had often wondered if my two insects were a pair; fortunately they were: on the 16th of March I had the pleasure of seeing them *in cop.* at 8 P.M. The eggs were deposited singly, on the cage and on the oak-leaves, from the 7th to the 20th of April. These began hatching on the 26th of the same month: they were supplied with oak, fed well, grew remarkably fast, and began going down on the 5th of June, and had all disappeared by the 12th of the same month. They spun a slight cocoon just beneath the soil, and remained till the 25th of August before changing to pupæ. This peculiarity of the *Xanthiæ* is mentioned by the Rev. J. Greene in the 'Insect Hunter's Companion,' p. 24, also in Merrin's 'Lepidopterist's Calendar,' p. 104. My first imago appeared on the 9th of September, the last on the 6th of October; the greatest number in one day six, on the 26th of September. The produce of the pair was thirty-three perfect specimens. — *J. Pristo; Alverstone, Whippingham, Isle of Wight, September 17, 1866.*

Habitat of Melissoblaptes bipunctatus. — As the history of this rare insect is not, I believe, generally known, I venture to supply that desideratum. The larva feeds on the roots of *Ammophila arenaria* on the sand-hills about Deal. The imago makes its appearance in July, when, if the evenings are still and warm, they run up the stems of this grass to near the top, where the males fix themselves, with their wings half-expanded. I have noticed this habit in the females of other insects, but never in the males: the females of *Melissoblaptes* keep their wings closed. On the least disturbance of the plant, which you cannot help, as it grows in a close mass, the males close their wings, and if the disturbance is continued they drop to the ground, but never attempt to fly; in fact I do not remember ever seeing one fly; but there is no doubt that, like many other species, they take one or two hours out of the twenty-four for that purpose. This insect is very local; you may find them on two or three plants amongst a great number, but nowhere near that spot will you find any more: the females are very rare, not more than one to a dozen males. — *H. J. Harding; 131, Lower Street, Deal.*

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A few Remarks on Mr. Birchall's List of Irish Lepidoptera.
By the Rev. J. GREENE, M.A.

As the compiler of the original List of Irish Macro-Lepidoptera, I have read with great interest that supplied by my friend Mr. Birchall to the 'Entomologist's Monthly Magazine.' I have been struck with surprise and admiration at the vast number of additions made to that list during the course of a little more than ten years. These additions, with inconsiderable—inconsiderable, that is, as regards numbers—exceptions, are almost entirely due to Mr. Birchall's own unflagging perseverance and untiring ardour. True he has certainly had the advantage of being almost the only Entomologist who has ever attempted anything like a systematic and consecutive investigation of the Lepidoptera of Ireland; but this was neither his "fault" nor his "misfortune." I do not know a single resident collector, deserving the name, in Ireland, except the Rev. J. Bristowe. A few Englishmen, as Messrs. Barrett, Shield, Wallace and others, have occasionally made a hasty raid into the country, and spoken favourably of it. I myself, though an Irishman, have not had more than two or three opportunities of collecting there, and then only for a week or two at a time. Considering, farther, that Mr. Birchall's explorations extended over portions only of three counties, Dublin, Galway and Kerry, I consider the results wonderful, and that to him is mainly due the credit of producing a list of which Ireland has no reason to be ashamed. In examining his list so far as it has been published, it has occurred to me to make a few observations upon it, and to ask one or two questions. In his prefatory remarks Mr. Birchall refers to my old list, observing very justly that he is unwilling to reject from it any species as indigenous which could be retained with any show of reason. This resolution he has carried out with praiseworthy

impartiality; but I would ask him, and this shall be my first question, why he has omitted *Papilio Machaon*? There are no less than three authorities given in my list for the occurrence of this species, as follow:—"Mr. Haliday; seen on the wing (Mr. Hardy); larva found at the Botanical Gardens, Ball's Bridge (Mr. Coulter)." I should not myself have thought this insect likely to occur in Ireland, since, as Mr. Birchall observes in another place, the few insects seem to be scarcely represented in Ireland at all; but as three authorities are given, I think the species ought not to be rejected, especially as others are retained on the testimony of single individuals, and without any locality given.

Sesia culiciformis.—This insect is inserted in my list on the authority of Mr. Haliday. I see no reason why it should not occur in Ireland, but Mr. Birchall has omitted it. Probably it escaped his notice.

There remains only one other omission to which I wish to direct Mr. Birchall's attention, but it is a startling and formidable one, *viz.*, that of *all* the Pseudo-Bombyces. This must be pure inadvertence. [It was an editorial mistake, corrected at p. 109 of the October No.] Or is it the fact that he unconsciously overlooked them altogether, owing to what I must always call it, the unnatural divorce of these so-called Pseudo-Bombyces from the so-called Nocturni, and the still more unnatural introduction of the Geometræ between them? It irresistibly reminds me of the following story in Lord Lytton's 'My Novel':—"A worthy couple, named John and Joan, had lived happily together many a long year, till one unlucky day they bought a new bolster. Joan said the bolster was too hard, and John that it was too soft. So of course they quarrelled. After sulking all day they agreed to put the bolster between them at night. After they had thus lain apart for a little time John sneezed. 'God bless you!' says Joan over the bolster. 'Did you say God bless me?' cries John; 'then here goes the bolster!'" Now the Geometræ are, in my judgment, the "bolster" of this story, and in arranging my cabinet I have used John's words, "Here goes the bolster!" and the Nocturni and Pseudo-Bombyces are re-united. But to return. As this Catalogue will unquestionably for many years be the standard of reference for the Irish Lepidoptera, Mr. Birchall will no doubt give these

Bombyces at the close of his list, with probably some addenda and corrections. Under this impression I am desirous of making, in my own list, one or two alterations or remarks, in the hope that Mr. Birchall will kindly incorporate them, in some shape or another, at the conclusion of his paper.

"*Notodonta dictæoides*. One pupa at Rathfarnham." — This from my list. In addition to this I have occasionally taken the larva.

"*N. Dromedarius*. There are beautiful specimens of this insect in the University Museum." — In the autumn of 1851, when in the County Longford, I took eleven pupæ at the roots of a single alder. These all produced splendid moths, but so different from the typical *Dromedarius* that at the time I did not think they belonged to that species at all. I gave a pair to Mr. Bond, who was much struck with their beauty and peculiar appearance. He considered them to be the *var. ?* *Perfusca*. Is this latter a species, or only the Irish form of *Dromedarius*? I have never seen anything like them elsewhere. It is worthy of notice that the late Mr. Stephens considered *Perfusca* a distinct species, and built his opinion on the examination of specimens all of which were captured in the neighbourhood of Dublin.

N. tritophus. — I have represented Mr. Shield as saying that he took a larva at Howth, feeding upon alder, which he felt confident was this species. I have, however, no doubt whatever that he was wrong, and that the larva was only *Dromedarius*. I had fallen into the same error myself previously. (See Zool. 1851, p. 3494).

Before leaving the Bombyces I would ask Mr. Birchall if he has anything to tell us about the reputed *N. bicolora*?

Ceropacha ocularis. — I speak of having taken a pupa at the roots of *oak*. It should have been *poplar*.

There are three species of *Noctuæ*—*viz.*, *Concolor*, *Saponariæ* and *Ravida*—inserted in Mr. Birchall's list on my authority. In each instance I have added a note of interrogation, as expressing doubt, though I see no reason why the two latter should not occur in Ireland. One other remark and I have finished with my own list.

Eurymene dolobraria. — This species is given doubtfully,

and without any locality. I subsequently took a few pupæ under moss on beech trees in the County Longford.

Ere I close I have one or two remarks to make upon the species of *Eupithecia* as given in Mr. Birchall's list.

Subumbrata. — Mr. Birchall speaks of this as *common*. Does he mean by *Subumbrata* the *Dodonæata* of our old lists, or the *Subumbrata* (*Piperata*, *olim*) of our present list? If the latter, I am surprised to hear of its being "common." It is unquestionably a rare and local species in this country. I never met with it, except at Halton, in Bucks. Did Mr. Birchall take the perfect insect or the larva? If the latter, upon what did it feed?

Virgaureata. — This is also described as common and in the neighbourhood of Dublin. I have never met with the larva, though I have searched many hundred plants of ragwort and golden rod, in that locality.

Arceuthata. — This is said to occur at Killarney. Is Mr. Birchall certain that it is that species? If so, how does he distinguish it?

Innotata (*Fraxinata* ?); *Expallidata*. — These are given on the authority of Mr. Bristowe. Here, again, I must ask is he certain of his species? I have diligently searched for the pupæ of the one and the larvæ of the other, without finding the slightest trace of either. I ask these questions about the *Eupitheciæ*, knowing by past experience the extreme difficulty of determining many of the species, especially in the perfect, or rather the often *imperfect*, state.

To conclude, I feel sure that Mr. Birchall and I are much too old friends for him to take exception to these few remarks, or to consider them made in a captious spirit. Far from it. I consider this list as a *most* valuable and interesting acquisition, and, as I have already said, it will be for years to come the sole source from which we can derive any reliable information as to the *Lepidoptera* of Ireland.

J. GREENE.

Sudbury, Derby, Sept. 18, 1866.

Life-history of Acidalia veterata (Gregson). — This is an old and well-known Lancashire species, although not hitherto

introduced into our lists. The eggs are laid, in confinement, on *Polygonum aviculare* (common knot-grass), a plant which grows freely in three of the localities where the perfect insect occurs, but not in the fourth; it therefore appears probable that in a state of nature the larva feeds on some other plant. The eggs are hatched in a few days, and the young larvæ feed freely on the knot-grass throughout July; in August and September they appear to have attained their full size, and then hybernate, attached by their claspers to the stems of the knot-grass. In the spring they feed for a short time, and are full-fed in May. [The full-grown larva rests in a very rigid position on its food-plant, attached by its anal and ventral claspers; it is bent at the latter, the anterior part of the body being invariably held at an angle of about forty-five degrees; the feet crowded together, and the first pair touching the mouth: when touched or annoyed it tucks in its head, and thus bends its body into a very elegant volute: the head is exserted, scarcely so wide as the 2nd segment, prone, and manifestly notched on the crown: body much attenuated anteriorly, and having a dilated lateral skinfold, which gives it an increasing width from the 3rd to the 9th segment, inclusive, which is decidedly the widest; the 10th and following segments are restricted and extremely verrucose; every segment is slightly wider at its posterior than at its anterior margin, so that the sides, when viewed from above, have a notched or serrated appearance; the segments are transversely, deeply and regularly wrinkled, scabrous, and sparingly beset with bristles, which on the anterior segments are directed forwards; the transverse wrinkles generally divide each segment into eight very narrow but very distinct sections. Colour of the head and body dull brown; the dorsal area of the latter has five pairs of very slender stripes, of which the medio-dorsal pair is direct and continuous from the head to the anal flap; the next pair commences on each side of the 5th segment, and terminates on the 9th segment; this pair is sinuous on the 6th and 7th segments, widely distant from the medio-dorsal pair at the anterior margin of both the 8th and 9th segments, but closely approximate to the medio-dorsal pair at the posterior margin of the same segments, thus enclosing a somewhat pear-shaped area on each of these segments; and each area so enclosed

contains one rather conspicuous dot on each side of the medio-dorsal pair; the second lateral pair is sinuous, interrupted, indistinct; the 2nd, 3rd and 4th segments have a decided dark lateral, or perhaps rather subdorsal, stripe, common to all three; the 9th segment has a very decided whitish space occupying each posterior angle; the 10th segment has a double black dot on each side. The ventral is rather more variegated than the dorsal area, but its markings are less constant; there is a medio-ventral stripe, extending from the 4th to the 10th segment, almost white, but this is interrupted at the interstices of the segments by a darker transverse band; and each of these darker bands resolves itself into dull brown ground colour, and several longitudinal series of intensely black dots; none of these series contain more than five of the black dots, and some have only three; these dots form portions of sinuous, but interrupted, stripes, very similar to those described on the dorsal area; the feet and claspers are much the same colour as the body.] The moth appears on the wing in June and July, flying at dusk. The male expands from three-fourths of an inch to one inch; the female [*? mancuniata*] is smaller. Head and face dark; antennæ setaceous and light-coloured; the collar ochreous; the thorax and wings rich creamy white, sometimes smoky; fore wings somewhat rounded on the costa, which is slightly ochreous along its outer edge; tips of wings produced, rather pointed (in the female less so, rather rounded); the fore wings have five suffused, but definite, strigæ; the first, placed on the first third of the wing, is oblique from the base to near the costal nerve, where it turns quickly inwards; the second runs through the centre of the wing, and this and the three outer strigæ are about equidistant and slightly waved: hind wings rounded, with only four strigæ in the majority of specimens, though in a few I have observed a fifth as well defined as the other four; all the wings are irrorated with yellowish or darkish atoms, and have a series of well-defined small cilia-spots at the base of the cilia, nine on each wing: the abdomen is of the same colour as the wings; the legs are dark yellowish ashy. Under side: chest ashy; the fore wings suffused with smoky, darkest on the basal costa, with two or more strigæ, one of them well-defined, and having a central spot on each wing, which spot is sometimes percep-

tible on the upper side of poor specimens. This insect stands in my 'Lepidoptera of the District around Liverpool,' published in 1857, as "*Acidalia subsericearia*, *Haw.*, not uncommon on the pasture-lands near the sand-hills of Leasowe; a few taken in lanes around Bidston, &c.;" and it also appears in Mr. Brockholes' 'Lepidoptera of Wirrall,' Cheshire, as taken by himself near Leasowe sand-hills. That it is distinct from the *subsericeata* of the western cabinets is self-evident, but that it differs from Haworth's insect is not so clear to me, and I have long believed there would be a propriety in changing its name, or of giving a new name to the Bristol insect which stands in most cabinets as *subsericeata* of Haworth. [Guenée, after describing Haworth's *Acidalia subsericeata*, makes the following observation:—"Haworth has described this species in such a manner that it cannot be mistaken, but he lays stress on the absence of the cellular dot, a character by no means constant. It varies extremely in shape, in the character of the transverse lines, which are more or less sinuous, and in their relative distance from each other; I am therefore inclined to think that it comprises two, three, or even four distinct species; nevertheless I have been unable, up to the present time, to find constant characters whereby to separate them with certainty." To this I ought to add that the larvæ, of which Mr. Gregson has permitted me to add a somewhat lengthy description, appears to correspond rather closely with that of *Acidalia subsericeata*, so ably described by Mr. Crewe at page 8732 of the 'Zoologist.'] —*C. S. Gregson; the additions in editorial brackets by Edward Newman.*

Description of the Larva of Acidalia fumata.—The moth flies in swarms over and amongst *Calluna vulgaris* (common ling), on the hills of the West of Scotland; but whether the female deposits her eggs on the ling or on the dwarf *Salices* (sallows) has not been ascertained. The eggs from which the caterpillars now described emerged, were laid in a pill-box in August, and have fed freely on willow. The full-grown larva rests with the claspers firmly attached to the edge of a leaf, the body, from the ventral claspers to the head, being kept perfectly rigid, and held in a straight position at an angle of 45 degrees, the head being semiprone, and the feet crowded together and directed forwards; it sometimes tucks

in its head when annoyed, the anterior part of the body assuming a graceful curve, but more commonly falls from its food-plant, retaining its straight rigid position, in which it exactly resembles a twig of the ling. Head and body about equal in width; head broadly but very indistinctly notched on the crown: body extremely slender, notwithstanding the presence of a dilated lateral skinfold; the 12th segment is slightly elevated; the divisions of the segments are not clearly defined, but each is transversely wrinkled, and divided by the wrinkles into fourteen or sixteen extremely narrow but distinct sections. Colour of the head wainscot-brown, with four longitudinal darker marks, which are continuous with dorsal stripes on the body: body pale wainscot-brown, with a medio-dorsal darker stripe, which increases in intensity at the divisions of the segments, and still more at the anal extremity; it is traversed throughout by a thread-like paler stripe; between this medio-dorsal stripe and the spiracles is a rather paler stripe, also intersected by a paler thread-like stripe; the skinfold is paler than the dorsal area, and below the skinfold is a darker stripe, which becomes more intense towards the anal extremity, and terminates in the ventral claspers; the ventral area is very pale, except between the ventral and anal claspers; the spiracles are black, and there is a black dot below the 2nd, 3rd and 4th spiracles; the feet are very pale; the claspers darker, but having a pale external area. I am indebted to Mr. Birchall for a bountiful supply of this larva, which has not been previously described. Although apparently full-grown on the 25th of September, they seem inclined to hibernate.—*Edward Newman.*

Life-history and Characters of Aplasta ononaria.—When last at Epping my friend Mr. Doubleday showed me a specimen of *Aplasta ononaria*, given him by Mr. Piffard, and taken by that gentleman about the 18th of July, in the Warren at Folkestone, amongst plants of *Ononis arvensis*. The genus *Aplasta* was established by Hübner in 1816, and has been adopted by Herrich-Schäffer, Lederer and Guenée; it forms part of the genus *Fidonia* of Duponchel, and of the genus *Cabera* of Treitschke and Boisduval. Guenée appears to have exercised his usual judgment in retaining it as a distinct genus, since it exhibits no affinity with either *Fidonia* or *Cabera*, from both of which the larva widely separates it.

The following sketch of its life-history and distinguishing characters are derived almost exclusively from Guenée. The larva occurs in April and September, on *Ononis spinosa* (rest-harrow), the only plant on which it has been known to feed: it is extremely sluggish, and never leaves its food-plant: it is short, fusiform, obese and without tubercles, and is entirely covered with short stiff hairs; its colour is pale dull green, with a darker medio-dorsal stripe, and a paler but indistinct spiracular stripe. When full-fed it spins a cocoon on the surface of the earth amongst moss, and therein undergoes its change to a pupa. The moth appears on the wing at the end of May, and again in July and August. It would perhaps be rash to state, without farther proof, that there are two broods of this insect in the year; but the facts of the case seem fairly to lead us to that conclusion: it is highly probable that the larvæ observed in September hibernate at the roots of the rest-harrow, and feed again in April, and thus that these apparent broods are nothing more than seasonal appearances of the same individuals; such hibernating larvæ would spin their cocoons in the beginning of May, and appear on the wing at the end of the month. Neither larvæ nor perfect insects appear to have been observed in June, but at the end of July and in August the moth again appears: it seems therefore reasonable to suppose that a generation is matured between May and August, and if so the readiest way to obtain a series would be to cut the rest-harrow in June, and shake it over a collecting-net, or into an umbrella: if the larvæ were then feeding they would inevitably be found. The antennæ of the moth are perfectly simple and setaceous in both sexes; the labial palpi approximate, scaly, sharp-pointed and slightly curved at the extremity; the maxillæ are small, almost rudimentary; the fore wings are rather pointed; the hind wings rounded, but truncate at the anal angle: the colour of the wings is dull ochre, thickly irrorated with brick-red dots, and having a scarcely perceptible median shade common to them all, and due to the crowding of the dots; the hind wings are rather paler than the fore wings; the under side has the median shade more distinctly marked than the upper side: the sexes are alike. This insect is almost sure to occur wherever the rest-harrow is abundant: Guenée describes it as common near his residence at Chateaudun.—*Edward Newman.*

Entomological Notes and Captures.

Vanessa Ichnusa in North Lancashire. — Mr. Gregson (Entom. iii. 129), referring incidentally to specimens of *Vanessa Urticæ* from Hawkshead, North Lancashire, without the two outer discal spots (said to be always present), desires lepidopterists to call these "*var. Ichnusa, Bon.*", the said form being common to Sardinia." Now, I am sure Mr. Gregson will kindly excuse me when I say that if ever the truly southern form, *V. Ichnusa*, should occur in this country, its capture and breeding in this island would imply a great deal more than the mere addition of a variety of *V. Urticæ* to the British catalogue. Besides, Mr. W. F. Kirby reminds us that, slight as is the difference between *Urticæ* and *Ichnusa*, it is correlated in the larva (Trans. Ent. Soc. Lond., 3rd series, vol. i. p. 488); and Mr. Gregson would therefore benefit our knowledge of *V. Urticæ* and its varieties if he would try and breed his so-called *Ichnusa* from the egg, and point out any differences between such larvæ and the normal ones of *V. Urticæ*. The true *Ichnusa* of Bonelli has as yet only been found in Corsica (Mann), and, as Mr. Gregson justly observes, in Sardinia too (Monti Genargentu Ghiliani); and whether we consider it only as a highly-coloured southern type of *Urticæ*, or admit its specific claim, however weak it may be, it is certain that the present range of this butterfly is restricted to Mediterranean latitudes, as only there those climatal and other agencies are still combined which may have compelled the denizen of a more northern zone to assume, in the course of ages, the fiery red garb of the present *Ichnusa*. The high importance of insect-geography is now becoming more and more appreciated throughout the world; and lest some unlucky foreigner, who perchance may be only superficially acquainted with the lepidopterous riches of Great Britain, should attach a meaning to Mr. Gregson's words which probably they were not intended to convey, I have ventured to publish this note, feeling confident that none will be readier kindly to bear with my remarks than those who are themselves actively engaged in mapping out the range of any insect, be it in the field or in the study.—*Albert Müller; Penge, S.E., October 2, 1866.*

Arctia fuliginosa double-brooded.—I have this season been

rearing *Arctia fuliginosa*, and the results prove that species to be (at least at Southsea) double-brooded. Will those of your readers who have bred the insect let us know in what parts of Great Britain it is single-brooded? On the 30th of last May I received, from a lady at Leominster, a few eggs of this species which had been deposited in a chip-box. On the 5th of June the larvæ emerged, fed up with surprising rapidity, and entered the pupa state between the 1st and 5th of July. The first imago appeared on the 10th, and the last on the 13th, of that month. These deposited eggs on the side of the breeding-cage, which hatched in ten days, and the larvæ are now about half-grown, and will be nearly full-fed by the time they hybernate, if they do not go to pupæ this autumn. I am positive that these results were not brought about by forcing, as the larvæ were kept in a cage out-of-doors, and supplied with fresh dock-leaves twice a week. I send you a few of the larvæ of the second brood, that you may have the opportunity of following them through their future changes, and of corroborating what I have written.—*Henry Moncreaff; Southsea, October 8, 1866.*

Names of Galls.—Will you oblige me with the names of the insects which cause the accompanying galls?—*W. Thomson; Forest Hill, September 25, 1866.*

[The larger is the artichoke gall: it appears to be an abnormal development of the acorn cup, and is peculiarly interesting as a mimetic representation of the acorn cup of a species of oak which does not occur in Britain: the insect which causes it is *Cynips Fecundatrix* of Hartig. Mr. Walker has found the following insects to be parasitic on the artichoke gall:—*Entedon leptoneurus* and *Megastigmus Bohemanni*. The small flat gall is commonly known as the oak spangle; for many years it was a matter of doubt whether it was a gall or a fungus, both Botanists and Entomologists being desirous of rejecting it. It has, however, been ascertained that it is produced by a minute gall-fly, called *Cynips longipennis*. I shall at all times be gratified to receive questions about galls or gall-flies, and have no doubt of being able to answer them, with the kind and ever ready assistance of Mr. Walker.—*Edward Newman.*]

Egg Parasite of Orgyia antiqua, &c.—Mr. Hammond, of St. Alban's Court, has sent me some eggs of *Orgyia antiqua*

perforated by the exit of a minute Hymenopteron, together with specimens of the parasite. Mr. Walker has obligingly supplied the following note on them:—"The little egg-parasite is *Telenomus Phalænarum*. It is parasitic on the eggs of various species of moths and of Pentatonidæ. I believe that all of the genus are egg-parasites. I have described it and others in the 'Entomological Magazine:' it belongs to the family *Platygasteridæ*, formerly a part of the *Proctotrupidæ*."—*E. Newman*.

The Army Worm.—"I was superintending the issuing of weekly rations, when a gentleman came into the yard with several of the well-known worms on a cotton-leaf. Holding it up before a negro man, an old hand on the place, he said, 'What kind of worms are these?' The negro at once recognized them and exclaimed, 'Master, they are army worms; my God, we are ruined.' This worm is produced by a winged moth, which flies from leaf to leaf depositing eggs, each moth depositing hundreds. In from seven to ten days the eggs are hatched and the worm appears. At once it begins its work, eating each leaf as it goes, growing rapidly, and attaining in eight or nine days its full size, about one and a half inch. It then folds itself in a leaf, and passes through the chrysalis state in seven days, reproducing the winged moth, which again deposits eggs, and in ten days afterwards the worms swarm in myriads. These caterpillars are of two kinds, or colours rather, which I fancy indicates the different sexes. One is yellow, with a brown stripe down the back, dotted on each side with small black spots. The other is striped brown and yellow, the brown being a broad stripe extending down on either side the whole length of the worm, and bordered by a very narrow white line which divides the brown from the yellow. They have seven pairs of legs; one pair at the end of the tail, four central pairs, and two pairs near the head. By arching the spaces they crawl with a quick, measuring movement, and upon being touched skip to some distance. They have great vitality, and no experiment, except to crush them, has been successful in destroying them. A friend suggested that tobacco smoke would kill them. I filled my pipe with strong tobacco, and concentrated the smoke upon a lively fellow for a few minutes. He skipped about, gradually sickened, was seized with black vomit, and turned on his

back apparently dead. Two hours afterwards he had entirely revived, and was marching around as if hunting for something to eat." — *Liverpool Mercury*, Sept. 11, 1866. In reference to this extract, can you supply the scientific name of the "army worm," or say whether the statement that it passes through the larva state in the short period of eight or nine days is a fact, or only the fiction of a speculator for a rise in cotton? — *Edwin Birchall; College House, Bradford.*

[The insect is said to be the larva of *Heliothis armigera*, and from its having been thus named by the scientific the name "army worm" has originated: but several points remain to be settled. Is the insect really the same as our European *Heliothis armigera*? Is the present species the same which destroyed the cotton crops in 1788, 1800, 1825 and 1845? Have any reliable observations on the life-history of our European insect been recorded? Information will be thankfully received from any of my readers. — *Edward Newman.*]

Dicranura bicuspis and *Acronycta Alni* at *Leominster*. — My son has had the great good fortune to take a larva of *Dicranura bicuspis* on alder, and one of *Acronycta Alni* on oak; the latter was injured, and has unfortunately died. — *E. S. Hutchinson; Grantsfield, Leominster, September 19.*

[Mrs. Hutchinson does not wish to part with *D. bicuspis*: please therefore not to apply. — *E. Newman.*]

Time of Emergence of Dicranura furcula. — On the evening of the 10th of July, between 8 and 9 o'clock, while sugaring some old willows at Lee, I noticed something struggling between the bark to get free, and on examination I discovered it to be a specimen of *Dicranura furcula* freeing itself from its cocoon: when free it crawled about six inches from its case, and there remained until it had expanded its wings: it was quite dark before it was fit to take. I took one in July, 1863, at the same hour, with its wings quite limp. Is it general for this species to leave the pupa at that particular time? If so, it may be interesting to Entomologists in want of it. — *W. West; 6, Green Lane, Greenwich, September 24, 1866.*

Captures at Burford. — One specimen of *Xylomiges conspicillaris*, probably dug amongst a batch of pupæ between Worcester and Stourport; one *Notodonta dodonæa*, from a

batch of five pupæ dug near here ; one *Trichiura Cratægi*, at light ; five *Geometra papilionaria*, from larvæ feeding on birch ; one *Notodonta dromedarius*, from a larva feeding on birch. I had a larva of *Acherontia Atropos* brought me last week, but have not seen a single specimen of *Macroglossa Stellatarum* this year. I saw a specimen of *Epunda lutulenta* on a lavender-bush close to the spot where I took one last year, but did not get it. — (Rev.) *E. Hallett Todd* ; *Windrush Rectory, Burford, September 24, 1866.*

Sialis fuliginosa in Dorsetshire. — Mr. McLachlan informs us, in the 'Entomologist's Monthly Magazine' for September, that he has seen specimens of *Sialis fuliginosa*, captured by Mr. Dale at Glanvilles Wootton, similar to those taken at Rannoch.

Bombyx castrensis at St. Osyth. — Mr. Laver, of Colchester, states, in the same journal, that he has found the larvæ of *Bombyx castrensis* in abundance at Mersea and St. Osyth, in Essex : he omits to mention the food-plant and date : great numbers of them died : he would have found them feed greedily on *Statice Limonium*.

Sericoris euphorbiana at Folkstone. — Mr. Meek records, in the Ent. Mo. Mag. for September, that he took this previously unique species at Folkstone last July.

Catoptria microgrammana at Folkstone. — Mr. Meek records that he took this rarity at the same time and place.

Amara alpina on Grayvel. — Mr. Blackburn, whose name will be familiar to my readers in connexion with the 'Weekly Entomologist,' a journal discontinued for the present, has recorded, in the 'Entomologist's Monthly Magazine' for September, the occurrence of *Amara alpina*, *Fab.*, on Grayvel, a mountain in Perthshire, 3000 feet above the sea-level : this insect was taken early in July.

Homalium Heerii near Loch Rannoch. — The same gentleman records the capture of this species near Loch Rannoch.

Epuræa variegata near Loch Rannoch. — Mr. Blackburn also took four specimens of *Epuræa variegata* from Fungi growing on rotten birch trees near Loch Rannoch, in July.

Deilephila lineata at Brighton. — A specimen of *D. lineata* was picked up by a gentleman, on the ground at the race-hill at Brighton, on the 3rd of last May. — *G. Champion* ; 274, *Walworth Road.*

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A Chapter on Galls. By EDWARD NEWMAN.

IT has often occurred to me, as worthy of note, that while some insects, as beetles, butterflies and moths, have attained a positive money value and a certain amount of fashionable status, others, which appear quite as attractive to the uninitiated, and possess an economy far more interesting, should have no standing at all, in either the mercantile or fashionable world, but should be absolutely neglected and despised.

In this position is the family of Cynipsites; and, at the imminent risk of losing a large share of the popularity which the 'Entomologist' and its Editor are now enjoying, I venture on introducing the gallflies to the notice of my readers, and on inviting them to investigate a subject which seems to me fraught with deep instruction.

Galls are not merely attractive objects in themselves, but the insects which cause them are most delicately fashioned, and the parasites they support are often more brilliant than the choicest gems fresh from the hands of the lapidary. As mere objects of beauty, galls have abundant claims on our notice, but the marvels of their history increase those claims more than a hundredfold. The Aphides have long enjoyed an ample share of the attention of the scientific: this has sometimes been exhibited in stolid wonderment at their curious reproductive powers, but more commonly in speculative guesses at the rationale of the mystery. The reproduction of gallflies is far more miraculous; and although by the reflecting mind it must be accepted as *natural*, yet the facts, as detailed according to the best of our ability, appear altogether *supernatural*. It is ten years since I made the statement that twenty-eight well-known species of Cynips have maintained a regular succession of generations, multitudinous in the number of individuals, without the discovery

of a single male. This statement has received neither confirmation nor contradiction; nor have I the slightest evidence that it has ever elicited even the most cursory investigation. Yet it is a fact, an undisputed fact, that no gall, up to the present hour, has ever been known to produce a male Cynips! Shall we, then, conclude that their reproduction is entirely agamic? Who has not smiled at the Irishman's assertion, when boasting of the purity of his blood, that his ancestors had been childless for ten generations? But here we have a phenomenon far more startling: in gallflies we find an uninterrupted series of generations of virgins from the dawn of creation to the present hour; each generation building—no, not building, but compelling the trees to build for them and for their children—fairy palaces of the most exquisite beauty. No poetical romance, no "strange story," no tale of the *Elixir vitae*, or legend of the rosy cross, was ever half so wonderful.

When advocating the study of galls, I have generally been met, in the first place, with the difficulty of preserving them; and in the second, with the difficulty of learning their history: I admit the existence of a certain degree of difficulty, but I strenuously contend that it may be and ought to be overcome. Is it not an admission of incapacity, nay almost of imbecility, to say we cannot preserve these beautiful objects? They are neither fragile nor evanescent; surely nothing more is required than a careful series of experiments to ensure a satisfactory result; and there is not the slightest reason to doubt that galls may be preserved for years, perhaps even for centuries, in all their pristine beauty of form and colour.

One of our galls, familiarly and pleasantly known in our boyish days, the "oak-apple," or "King Charles' apple," has acquired something like historical celebrity: I need scarcely recount how King Charles, after the Battle of Worcester, concealed himself in the Boscobel oak; and how many a sign-board represents that illustrious monarch seated sedately among the boughs, and wearing a very conspicuous crown, which one would have thought likely to betray him, but which seems to have escaped the notice of Cromwell's troopers, who are seated on prancing horses beneath the tree: all this is supposed to be good and true history; but it

is not so generally known that a legend is currently received, that the King being hungry, the oak in compassion produced these apples for his especial benefit, and has continued to produce them, on every 29th of May, from that time to the present. King Charles' apples are still annually collected in great numbers, and, when the finder or purchaser can afford it, are covered with gold-leaf. Methinks these apples must have been bitter pills for the fugitive monarch, even though gilded, which, however, I believe a somewhat modern innovation; be this as it may, the oak-bough, with its scarcely expanded leaves and its gilded apples, are every year exhibited in commemoration of the monarch's escape. In the 'Book of Days,' by Robert Chambers, will be found a full, true and particular account of the King's escape, and a very pleasant description of Oak-apple day in the country. (See vol. i. p. 693—700).

So much for the galls; and now a few words about their inhabitants: let me entreat my readers to study the life-history of these inhabitants; and this is the course I recommend:—Procure fifty jam-pots, more or less as you may require: as soon as you have found a gall, and this, in the country, is the occupation of only a few minutes, transfer it to jam-pot No. 1; then open a book already prepared, and having pages numbered 1 to 50, therein make the first entry, "Bedeguar of the dog-rose, gathered 22nd September, 1866." No 2 perhaps may be "Bedeguar of the sweet-briar, gathered 22nd September, 1866;" No. 3, "Root-gall of the oak, gathered 22nd September, 1866;" and so on, until every jam-pot has become a nursery, each one being covered with a flat square piece of glass. Look at your nurseries from day to day, and you will soon perceive, on the surface of the glass, insects of diverse forms and colours; you will be astonished at their variety and beauty. Next procure a basin of hot water, 140° Fahr. is about the temperature, take off any glass that has an insect on it, hold it over the basin, give it a gentle tap, and the insect will immediately be seen floating quite dead on the surface of the water, with its wings and legs extended. Now prepare a number of small pieces of card, and write on one of them the number of the jam-pot, and the date on which the card is used; thus, "No. 1.—1, x. '66," the month always interposing between the day

and year; pass a pin through one corner, and then, dipping the card in the water, under the insect recently killed, it may be lifted from the water on the card, in the best possible position for preservation. By the application of blotting-paper to the edges of the card all superfluous moisture may be removed, and the insect in drying will adhere to the card. The insect will thus be preserved, in company with such particulars of its history as have been learned from this very simple proceeding. The multiplicity of forms and colours produced by the same gall will at first be a source of some little astonishment and bewilderment, but by degrees the inquirer will find that these have different parts to play in the great drama of life. First there is the real *Cynips*, the founder of the somewhat heterogeneous colony; then the parasites, often of several species, who have it in charge to keep the gall insects in check; and lastly, we have those inquilines, who, doubtless imagining the gall to be a domicile erected for their own particular benefit, have taken possession, and appropriated it entirely to their own domestic arrangements: these inquilines, or tenants-at-will of other peoples' houses, are of all classes of insects—*Lepidoptera*, *Diptera*, *Coleoptera*, *Orthoptera*, *Hemiptera* and *Neuroptera*; the original proprietress and her parasites being *Hymenopterous*. All the members of this happy family must be preserved and examined at leisure; and the amusement and instruction to be derived from the investigation will be found almost infinite.

I think I cannot conclude this desultory note more suitably than with an extract from the Prospectus of the proposed work on galls, by Mr. Armistead, of Virginia House, Leeds:—"Having been an observer of galls and similar excrescences for twenty years or more, and having collected most of the British species, and some American ones during a visit to that country, I am preparing a volume to contain the result of these observations. This work will include drawings and descriptions, with some attempt at classification. A coloured drawing of each will be given where practicable, and a description of every known gall as far as my own observation extends, including those described by others, not omitting some similar excrescences known as pseudo- or semi-galls, whose production may be variously

accounted for. Eminent artists have been engaged to make drawings from specimens for the volume now proposed, who have already produced some beautiful and faithful delineations. Being desirous of making the work as complete as possible, I shall esteem it a favour if any naturalist who may have observed or may possess any galls, wherever found, not hitherto known or described, would communicate with me, and furnish any specimens, drawings or particulars respecting them." I sincerely hope that my readers will give a ready response to Mr. Armistead's request.

EDWARD NEWMAN.

Revision of the 'Catalogue of British Coleoptera.'

By G. R. CROTCH, Esq.

(Concluded from page 137).

Chrysomela sanguinolenta, Linn.—The form of this insect found in Scotland appears to be probably the real typical form of Linneus, since it is the Swedish one. The Central-Europe form, described by Suffrian as his type, differs in several minute particulars. The investigations of Dr. Baly leave but little doubt that *C. distinguenda*, Steph., and its near ally, *C. marginalis*, Duft., must also be regarded as forms of this species, notwithstanding certain tolerably constant differences of colour and sculpture.

C. Hyperici, Forst.—This species is well described by Forster under this name, which is moreover very applicable, and was in constant use by Stephens and other authors.

Lina longicollis, Suffr.—Suffrian himself points out that the English species was referable to his *L. longicollis*. The true *L. Tremulæ*, Fabr., should have a thorax like *L. Populi*, but be smaller and without the apical black spot.

Phædon Armoraciæ, Linn.—M. Suffrian has ably defended his views on the nomenclature of this genus in a recent article in the 'Stettin Zeitung.'

Lyperus betulinus, Fourc.—M. Joannis, in his Monograph of this group, has shown that the true *rufipes*, Fabr., differs from the above in having entirely red legs, &c., and is apparently much rarer.

Aphthona cærulea, *Pk.* — *A. Pseudacori*, *Marsh.*, so common in this country, is certainly the cærulea of all continental collections. *A. violacea*, *E. H.*, is a much smaller insect, more like *A. Euphorbiæ*, *Fabr.*

Plectroscelis subcærulea, *Kuts.*—*M. Kutschera*, in his Monograph, describes the above species on English specimens. It appears, by comparison with his descriptions, that the insect hitherto known as *P. Sahlbergii* is *P. subcærulea*, the true *Sahlbergii* being very rare, and having occurred in Cambridgeshire only. It was detected some time since by Dr. Power, who had shown me two examples taken in the fens: these were returned as *P. Sahlbergii* by *M. Allard*. *P. subcærulea* differs in its longer antennæ and more elongate shape.

Thyamis castanea, *Foudr.*—It appears from an examination of my series of *Thyamis*, made by *M. Allard*, that the species from our fens, known hitherto as *T. brunnea*, is *T. castanea*, *Foudr.* *T. brunnea* is, however, common in this country, being confounded with *T. lurida*, from which its rounded shoulders at once distinguish it. It also has a great tendency to run black.

T. patruelis, *All.*—*M. Allard* has recognised that his *T. lateralis* was not the same species as *Illiger* has described; hence he has proposed this name for it.

Triplax Lacordairii.—*Mr. Waterhouse* has pointed out the error into which *Lacordaire* has fallen in citing this species; I have therefore re-named it; but it appears to me very doubtful whether any of the three species are really British.

Coccinella 12-guttata, *Poda.*—This has been considered to be the female of *C. 16-guttata*, but erroneously, as I have both sexes of that insect, which moreover is not uncommon, while the present one is very rare; I have seen, however, three or four certainly indigenous examples.

Orchesia fasciata, *Payk.*—*Thomson* has conclusively shown that this species must revert to the name "*fasciata*," and for *O. fasciata*, *Kr.*, he employs the name *3-fasciata*, *Zett.*

Carida flexuosa, *Payk.*—This species is omitted by *Mr. Rye* in his recent Catalogue, but incorrectly. It is first recorded in *Stephens'* '*Illustrations*,' as having been taken near Peterborough in a fungus. These specimens are still extant in the cabinet of *Prof. Babington*, to whom I am

indebted for one. Since that time it has been taken by Hardy in the Northumberland district, by Foxcroft at Rannoch (now in the Rev. A. Matthews' collection), and this last season by Mr. Sidebotham in Perthshire.

Lissodema Heyana, *Curt.*—I have returned to this name, since, though Gyllenhal described this species, Linneus, from whom he took the name, intended *Silvanus Surinamensis*, as his collection and description clearly show.

Œdemera nobilis, *Scop.*—This name is anterior to that of Linnæus by some years, and further obviates the difficulty of the same name recurring in two closely-allied genera.

Mordella aculeata, *Linn.*—This species is generally banished from our lists, but is unquestionably indigenous, though rare. I have two or three from Mr. Wollaston's collection, and have seen others taken in the West of England.

Mordellistena inæqualis, *Muls.*—The earliest name for this species will be *parvula*, *Gyll.*, which from Thomson's description is clearly identical with it.

Anthicus Schaumii, *Woll.*—It does not appear that we have the type-form of *A. tristis* at all: whether this is more than a variety I feel doubtful.

Phytosus nigriventris, *Chevr.*—This species, nearly allied to *balticus*, *Kr.*, occurs on our southern shores, where it seems to replace the northern species.

Euryusa Kirbyi, *Jans.*—I am at a loss to know how Mr. Rye, in his Catalogue, can have united this species with *T. inquilina*, *Märk.*, with which it has nothing in common. Märkel alludes expressly to having examined its tarsi, &c., and has demonstrated that it is a true *Thiasophila*: the insect found in this country, however, has well-developed male characters, and 4-jointed anterior tarsi, which at once connect it with *Euryusa*, of which genus it forms a new and very interesting representative. I may mention that specimens sent to Paris were returned as entirely unknown.

Crataræa erythroceras, *Steph.*—Stephens' name must here be recognized as prior to Erichson's, and as being well described; it is, however, superseded by the still earlier name *suturalis*, *Sahl.*, which appears to belong to this species.

Aleochara obscurella.—This group of insects appears to be in the utmost confusion, as far as regards synonymy. The

three species appear to occur on nearly all the coasts of N. Europe, but to be generally confounded together. Thomson clearly has not found *obscorella*, *Grav.*, at all; and his *obscorella* corresponds with *grisea*, *Kraatz*, for *Kraatz* says that it was sent him by Thomson as *obscorella*, *Gyll.* The *grisea* of Thomson is, however, evidently not that of *Kraatz*, but the opaque species recently described by *Fauvel*. In this country we have identified the opaque large species wrongly with *grisea*, *Kraatz*; it should be *Algarum*, *Fauv.*, as an examination of *Kraatz*'s description will soon show; moreover, *Kraatz* had a faint inkling of the existence of *Algarum*, *Fauv.*, as is shown by his final observations on *A. obscorella*. In this confusion it seems to me impossible to restore *Stephens*' name to any of the species, as he certainly never characterized them. *Mr. Rye*, in his Catalogue, has proposed the name *Fauvelii* for *Algarum*, *Fauv.*, but this alteration is unnecessary.

Oxypoda umbrata, *Er. nec Gyll.*—I was unaware till lately that *Kraatz* had re-named *Erichson*'s species *O. humidula* in *Berl. Ent. Zeit.* 414 (1865). The name *Erichsoni*, here proposed, is therefore withdrawn.

O. sericea, *Heer.*—Comparison of typical specimens show that *Waterhouse*'s *nigrina* belongs to this species. *Fauvel* also unites *O. exigua*, *Er.*, but in this I cannot concur.

O. incrassata, *Muls.*—*Mr. Waterhouse*, at the time, expressed doubts as to whether this species was not identical with his *aterrima*, which now proves to be the case.

Homalota Algæ, *Hardy.*—*Hardy*'s name certainly ought to be retained for one of the species which he described, and, as both *flavipes* and *maritima* are preoccupied, it may be advantageously employed. When two species are confounded under one name, it is usual for the person who distinguishes them to apply the old name to one or other of the separated species.

H. depressa, *Fabr.*—The use of this name will obviate the confusion attached to *H. brunnea*, *Fabr.*, which is identical with *Homalium brunneum*, *Pk.*

Oligota parva, *Kr.*—*Kraatz* has made this correction, the name *pygmæa* being preoccupied.

Quedius semiobscurus, *Er.*—Thanks to erroneous types, *Erichson* and the succeeding authors were entirely misled as

to this species. The description is, however, valueless, and though Marsham's types belong to *Q. rufipes*, *Grav.*, I do not see why Erichson's name should not be retained.

Philonthus concinnus, *Grav.* — This is a small form of *ebeninus*, noticed by Erichson and Kraatz, but apparently possessing constant characters. Thomson has first regarded it as a species, under the name of *varians*.

Xantholinus linearis, *Oliv.* — Thomson makes three species out of this: it is easy to see that his *multipunctatus* is common here, and in fact corresponds with our *longiventris*: whether we have a third I am not prepared to say; but these two, apart from general facies, &c., are readily separated by the finely alutaceous surface in *multipunctatus*.

Leptacinus pusillus, *Steph.* — *L. linearis*, *Grav.*, clashes with the *Xantholinus*, and must therefore take the next oldest name.

Lithocharis ferruginea, *Er.* — Here there is probably some confusion. Two or three of my specimens of *brunnea* answer to the description of the above, in that they have very certainly a longitudinal groove down the thorax, but in all other respects they resemble *brunnea*. Has Kraatz overlooked this channel in that species?

Lithocharis ruficollis, *Kraatz.* — The name *tricolor* is quite inadmissible, clashing with the *Xantholinus*.

Micracalymma marina, *Ström.* — Mr. Haliday appears to have first noticed that Ström described the *Micracalymma* at the same time as the *Æpys*, and under the same specific name. It is only just to restore this.

G. R. CROTCH.

University Library, Cambridge.

Life-history of Orgyia pudibunda. — The eggs are laid in June, in a crowded patch, on the upper side of the leaves of a great number of trees, among which I may mention garden plums of several varieties, *Quercus Robur* (oak), *Fraxinus excelsior* (ash), *Castanea vesca* (Spanish or edible chesnut), and *Carpinus betulus* (hornbeam), also *Humulus lupulus* (the cultivated hop): they are of a pale lead-colour inclining to white, and opaque at first, but after being laid about fourteen

days they become somewhat transparent, so that the enclosed larva may be seen through the shell. The young larvæ emerge almost immediately after this change in the appearance of the egg, and enter on life with the occupation of eating the egg-shell; they are most marvellous little creatures, very pale-coloured, with a few long bristle-like hairs, three or four times as long as the body, sticking out in all directions, but projecting more especially at both extremities; these long hairs may be seen through the egg-shell prior to the emergence of the larva, coiled round the interior of the shell: on shaking the leaf these little creatures fall, assuming a somewhat crescentic figure, and hanging by an invisible thread, exactly after the manner of a family of recently disclosed spiders; they soon begin to eat the upper surface of the leaf, making conspicuous brown patches; after a few days, as they increase in size, they pass through the leaf, making nearly circular holes, and thenceforward continue principally on the under side: when about to moult they spin a slight transparent web on the under side of the leaf, and beneath this the operation of moulting is performed: on emerging for the last time from this temporary retirement, they eat voraciously, and soon attain their full stature, their previous growth having been extremely slow. The full-fed larva rests on the under side of the leaf in a nearly straight position, but the back slightly arched; if disturbed it falls, rolled in a lax ring, but soon resumes a straight position and begins to crawl. Head almost equal in width to the 2nd segment, prone, not notched on the crown: body slightly attenuated at both extremities, the skin coarsely folded at the sides; the 2nd segment has two lateral tubercles or tubercular warts on each side, the upper one being the more conspicuous, and projecting on each side of the head; the 3rd and 4th segments have each eight warts; the 5th, 6th, 7th and 8th segments have each an erect, quadrate, medio-dorsal, dense tuft or tussock, which viewed sideways appears notched on the summit; they have also three warts on each side; the 9th and 10th segments have each eight warts; the 10th and 11th segments have each a medio-dorsal valvular opening, and also three warts on each side; the 12th segment has a slender medio-dorsal pencil of bristles springing from the centre of a wart, and there are two other warts on each side below

this median pencil; the 13th segment has six warts; all the warts emit radiating bristles; the claspers, being divided at the extremity, and the divisions spreading at right angles with the shaft of the clasper, assume the shape of a letter T inverted. Colour of the head pale delicate green; ocelli brown; dorsal area of the body delicate velvety green, interrupted between the 5th and 6th, 6th and 7th, and 7th and 8th segments, by a transverse band of intense velvety black, which becomes strikingly conspicuous when the larva rolls in a ring; in the incisures following these three a double spot appears of the same velvety black, and there is also a short black longitudinal line on each side of the 9th, 10th and 11th segments; the four dorsal tufts are generally pure snowy white, but sometimes tinged with yellow; the caudal pencil is pink; the bristles pale yellowish green; the spiracles concolorous with the ground colour, but surrounded with a delicate black margin; the ventral surface is intensely black; the feet and claspers pale green: it is one of the most beautiful of all British larvæ. Having attained its full size, it descends the tree on which it has been feeding, and spins, in a crevice of the bark, a somewhat double cocoon, the silk being intermixed with the hairs of its own body; the outer one is transparent and shapeless; the inner opaque, compact and oval: within this it changes to a rather obese pupa, beset, more especially about the abdomen, with shortish hairs; its colour is dark brown, the interstices of the abdominal segments being conspicuously paler. The moth appears in May and June. I have watched the progress of this species from the egg to the imago: the length of time occupied in the larva state was about ten weeks, and on more than one occasion ten days were occupied in moulting: I shall be glad to know the experience of others on this interesting subject. I am indebted to Mrs. Hutchinson, of Grantsfield, for a beautiful specimen of the full-grown larva.—*E. Newman.*

Ellopiæ fasciaria and *E. prasinaria*. — “I have lately solved, in a manner satisfactory to myself, an entomological problem which has long remained in obscurity. Our earlier authors generally treated *Ellopiæ fasciaria* and *E. prasinaria* as two perfectly distinct species, while more recent entomologists have regarded them as varieties of one species. If M. Guenée had had the opportunity of examining the larva of

E. fasciaria, and of comparing it with that of his *E. prasinaria*, he certainly would never have separated them in his 'Species Générales des Lépidoptères.' In my opinion the two constitute but a single species. *E. fasciaria*, which is the type, inhabits our neighbourhood, the larva feeding on the needles of *Pinus sylvestris* and other conifers. Pursuing my researches year after year into this subject, I have just obtained a result which appears conclusive. A full-fed larva found in May, on a fir tree on one of our mountains, almost immediately became a pupa, and after a few days the perfect insect appeared. It was a variety having the ground green, washed with flesh-colour; and it constitutes, most unmistakably, a connecting link between *fasciaria* and *prasinaria*, approaching the latter in the green ground, and the former in the flesh-colour which appears on the costa, the rays and the cilia." I have extracted this passage from Millière's 'Iconographie,' thinking it a matter of interest that a point of this kind should be definitively settled. It will be recollected that Guenée keeps these two insects apart, introducing a third, *Ellopia Manitaria* of Herrich-Schäffer, between them. Under *E. prasinaria* he has the following observation, to which Millière alludes in the foregoing extract: — "Modern authors are generally agreed in considering this a variety of *E. fasciaria*. As I have not seen many specimens of that species, and am unacquainted with the preparatory states of both, my opinion can have no great weight. Nevertheless, I may observe that while *E. fasciaria* is common in England, *E. prasinaria* is entirely unknown there. According to Eversmann this is also the case in Russia, and Sepp only figures it in his 'Lepidoptera of Holland,' although he had reared it from the larva. In Germany, on the contrary, *E. prasinaria* is the more common of the two, and has been reared from the egg without the occurrence of a single specimen of *E. fasciaria*. M. Delaharpe, not content with reducing these two *Ellopias* to the rank of varieties, adds that the slightest fumes of an acid transforms *E. prasinaria* into *E. fasciaria*, so that it is no longer to be regarded as a geographical or accidental variety, but as a chemical variety. This is going too far; for, if we admit that acids may change the green of *E. prasinaria* into a red exactly resembling that of *E. fasciaria*, I can scarcely believe they possess the

property of changing the white transverse lines of *E. prasinaria* into the bluish gray lines which we find in *E. fasciaria*." (Guenée, ix. 131). I think the last argument unavailing, but the question still remains, How is it that while *E. fasciaria* is common in England, *E. prasinaria* does not occur at all? —*Edward Newman*.

Life-history of Eupithecia rectangulata.—The eggs are laid in June and July, principally on the under side of the terminal shoots of the low-growing branches of espalian apple trees, in gardens, without respect to variety; the young larvæ emerge when the blossom-buds are swelling previously to bursting open, and then eat their way into the still unopened flower, and feed on its stamens and pistils; they tie the petals fast together, and thus form little dwellings, in which they lie snugly ensconced; and, thus concealed, they devour the furniture of their lodging, and as soon as this is exhausted they move freely to another bud, and serve it in the same way. The larva is semitransparent, and varying in colour from whitish yellow or whitish green to green, with a variably-coloured, rather broad, medio-dorsal stripe, often pinkish or reddish: it is about six lines in length; the head and anal segments are rather narrow. When the apple-bloom is over, the larva descends to the ground, and changes to a pupa, beneath the surface of the earth, in a slight web. [The thorax and wing-cases of the pupa are yellow suffused with olive, the abdomen tapering, the lower divisions and the tip blood-red. — *H. H. Crewe*, Zool. 7107.] The moth appears on the wing in June and July. In the North of Lancashire and in Westmoreland, where wild crab and "wassel" apple trees abound in the woods, I have seen this species abundant in August and September. Careful autumn pruning and burning the refuse will be a partial remedy: the blue tit-mouse will eat thousands of the larvæ, and should be protected and encouraged.—*C. S. Gregson*.

Life-history of Noctua conflua.—The eggs are laid in July on various low plants: the larva is polyphagous, but prefers *Silene acaulis* and the species of *Taraxacum*. The head is small and almost spherical; the body rather obese, smooth, and having the 12th segment slightly tumid dorsally. Colour of the head pale brown, the face having two conspicuous crescentic black markings placed back to back, that is, with

the convexity of each towards the median suture : the colour of the dorsal area of the body is greenish yellow, delicately striated with brown ; like the larvæ of many other true *Noctuæ*, it is marked from the 4th segment to the 10th, both inclusive, with a subdorsal stripe, surmounted on each segment with a wedge-shaped black spot, the apex of which points towards the head of the larva ; the medio-dorsal stripe is straight, nearly white, and delicately bordered on each side with brown ; it is scarcely perceptible on the middle segments. The spiracular stripe is indicated by a series of straight brown markings ; the spiracles are oval, black and encircled with white : the ventral is paler than the dorsal area, and has no markings : the feet are testaceous, the extremities black ; the claspers are concolorous with the ventral area, except at the extremities, which are brown. In the autumn this larva hibernates towards the roots of the herbage, feeding again in May for a short time ; when full-fed it again descends towards the ground, and, secreting itself among fragments of its food-plant, spins a cocoon of these materials, mixed with particles of earth ; in this it almost immediately changes to a pupa, which is of moderate length and ordinary form, and rather glabrous, brown, with a black tip to the abdomen, which is furnished with four straight but rather spreading spine-like bristles ; of these the outer one on each side is only half the length of the others. The moth appears in July. Treitschke was the first author to observe and describe this *Noctua* ; it was first found in Hungary, and subsequently in Silesia and Iceland ; M. Millière, from whose 'Iconographie' (ii. 61) the description of the larva is extracted, seems to think Iceland its true country. I have not thought it desirable to copy Millière's description of the imago, as I have been enabled, through the great kindness of my friend Mr. Backhouse, to distribute it widely among English entomologists : it is a *festiva* in miniature, and it is rather singular that this similarity does not seem to have struck the author I have been quoting.—*Edward Newman.*

Description of the Larva of Hecatera dysodea.—The larva feeds on the blossoms and seed of the common lettuce : it rests in a straight position on its food-plant, but falls to the ground when disturbed, and, tucking the head under its body,

embraces it with the ventral claspers, the anal extremity, together with the anal claspers, remaining extended. Head glabrous, scarcely notched on the crown, narrower than the 2nd segment, into which it is partially received: body cylindrical, but slightly attenuated towards both extremities; anal claspers spreading. Colour of the head pale dull olive-green, inconspicuously reticulated with darker lines: body pale dull olive-green, sometimes exhibiting a shade of gamboge-yellow; the dorsal and ventral areas are abruptly divided on a level with the spiracles, which are intensely black; dorsal slightly darker than the ventral area, and having also three darker, but nevertheless very inconspicuous, stripes; one of these is medio-dorsal, and intersected throughout by a slender paler stripe; the others are lateral and immediately above the spiracles: legs and claspers concolorous with the ventral area. When full-fed it descends to the ground, and changes to a pupa just beneath the surface of the earth. The moth appears on the wing in June. I am indebted to Mr. Doubleday for these larvæ, which were full-grown on the 31st of August.—*Edward Newman.*

Description of the Larva of Hecatera serena.—The larva feeds on the blossoms and seed of the garden lettuce: it rests in a straight position on its food-plant, but falls to the ground when disturbed, and, tucking its head under the body, embraces it with the ventral claspers, the anal extremity, together with the anal claspers, remaining extended. Head glabrous, scarcely notched on the crown, narrower than the 2nd segment, into which it is partially received, emits a few slender bristles: body cylindrical, but slightly attenuated towards both extremities; anal claspers spreading; there are a few minute warts, each of which emits a fine bristle, scattered about the body. Colour of the head dull pale greenish brown: of the body dingy yellow-green, the dorsal and ventral areas being divided by a very distinct yellow-green stripe, extending from the head to the anal claspers; this stripe is immediately below the spiracles, which are testaceous-brown, surrounded by a very delicate black ring; the 2nd segment has a quadrate smoky black dorsal patch, longitudinally intersected by a pale line; it is also bounded on both sides by a similar pale line; the dorsal area of the other segments is irrorated with smoky black,

which forms itself into a kind of dorsal ornamentation, consisting of a medio-dorsal and two lateral series of blotches; all these markings are very obscure, but there are two dorsal dots, placed transversely on each segment, which are very constant; the ventral area is irrorated *above* the claspers, but perfectly unicolorous and of a more decided green *below* them; legs and claspers concolorous with the ventral surface. When full-fed the larva descends to the earth, and, changing to a pupa just below the surface of the ground, spends the winter in that state. The moth appears on the wing in June. I am indebted to Mr. Doubleday for these larvæ, which were full-fed on the 31st of August.—*Edward Newman.*

Life-history of Botys terrealis. — The eggs are laid in June, on the erect shoots of *Solidago virgaurea* (golden rod), and the young larvæ emerge in a few days; at first they eat the leaves only, but no sooner do the flowers appear than they mount upwards, and from that time eat flowers only, stripping the entire spike. The full-grown larva rests on the partial stalks of the scape of the golden rod, among the flowers of which it spins a slight web; when disturbed it wriggles out of its retreat, falling to the ground, but never rolls in a ring. Head flattened, glabrous, porrected on the same plane as the back, narrower than the 2nd segment; body subfusiform, decidedly narrower at the extremities, and having the incisions of the segments so deep as to give the segments themselves a very tumid appearance; dorsal area of the 2nd segment very glabrous in front; anal claspers widely divaricating, extending considerably beyond the anal flap; all the segments have a few small scattered lateral warts, and every wart emits a strong lateral bristle. Head semitransparent, its general area almost colourless, but ornamented with a few amorphous brown markings: body dull whitish, tinged with pink, and having a distinct and clearly defined, pink, medio-dorsal stripe; there is also an indistinctly-serial arrangement of pink markings on the sides; warts black, bristles white; ventral area, feet and claspers dingy white. In some specimens the ground colour inclines rather to dull orange than pink. At the end of August the larvæ descend, and spin a loose web under or below the stones, and beneath this they live through the winter. During the following April they move about a little, and then spin a

long, oval, transparent cocoon, and therein change to a yellowish pupa. The moth appears about the second week in June, and seldom remains on the wing more than a fortnight: it is one of those insects of which the whole brood seems to appear simultaneously during a few hot days. I am indebted to Mr. Gregson for these larvæ, and an account of the economy of the species.—*Edward Newman.*

Life-history of Grapholita nevana.—This species deposits its eggs in July, and they are hatched in the following April or May, and then spin a web, and tie together the young shoots of the different varieties of holly, then just springing, and they thus form a dwelling-place, of which they devour the walls: when full-fed, at the end of May or in June, they spin a slight cocoon, and make up within the house they have partially eaten; the moth appears in from twenty to twenty-six days. The larva, when arrived at maturity, is greenish, with a dark head and corslet; it is rather stout: in some districts no holly can be successfully grown, on account of the abundance of the insect, one or more larvæ being found in every shoot of young growth, thus stunting and eventually destroying these valuable and ornamental trees.—*C. S. Gregson.*

Life-history of Plutella porrectella.—The larva is semi-transparent, and of a whitish green colour; it is attenuate at both ends and slightly hairy; the head and feet are green: it feeds upon the flower-shoots and leaves of *Hesperis matronalis* in May and June, and spins a white silken web under the leaves; in this web it changes to a light green pupa, and remains in this for twelve or sixteen days. About here (Liverpool) it is impossible to grow the beautiful rockets, as they form a breeding-ground for this pretty moth, over which there is no control: it deposits its eggs so freely on our white rockets that they are destroyed before they flower, unless great care is taken to pick off the leaves as the larvæ emerge from the egg: a few years ago the double white rockets were the pride of the South Lancashire and Cheshire gardens; at that time *Plutella porrectella* was rarely met with; now it is a pest only to be combatted by clearing away as many of the lower leaves from our plants in autumn as can safely be spared, and in the following spring keeping a sharp eye on the plants in April and the beginning of May.—*Id.*

Life-history of Pterophorus plagiodactylus.—The larva feeds on *Scabiosa columbaria* in April and May, eating down into the heart of the plant before its flowering-stem is thrown up, and thus utterly destroying it: it is of a light green colour, hairy, and gradually attenuated from the head to the anal extremity: the pupa is slender, with green wing-cases and a pinkish body; it is suspended by the tail, either from its food-plant or from any blade of grass or other object it may find in the neighbourhood; in this state it remains about fifteen days, when the perfect insect appears. Head and face fuscous; fore wings irrorated with dark scales on the anterior portion; inner margin ochreous, irrorated; a small dark spot on the third part of the wing; then a large wedge-shaped one at the head of the cleft, and a dark streak in the first lobe, the first cleft edged with a whitish streak; under wings, together with their cilia, brownish; thorax dark; first segment of abdomen triangular, ochreous, edged with white; upper surface of the legs dark, spurs and feet light. I am not aware that this insect or its larva have ever been previously described: the specimens from which the above descriptions were made were found in the larva state at Llanferris, when I was there in April last, in company with Mr. Greening: the bred specimens were of average darkness, but bred specimens vary much in colour. The plant destroyed by this insect grows on ground where only sheep and goats can travel on the ledges of the rocks, and were it not kept in check by the larvæ would soon cover the ground with a plant I have never seen eaten by any animal.—*C. S. Gregson.*

Entomological Notes and Captures.

Note on Pterophorus Lienigianus.—The larva of this species is still unknown to me, but the leaves of *Artemisia vulgaris* (mugwort), which it has eaten, have been most kindly forwarded to me by Mr. Harding, of Deal, to whom alone, I believe, is its life-history known: in the most liberal spirit Mr. Harding has promised to supply me next year with eggs and larvæ, that I may describe them for the information of all. The antennæ of the perfect insect are rather short and slender; the head and thorax light ashy gray; the

upper wings ashy, tinged here and there with ochreous shades; costa slightly darker near the base; then a dark costal streak-like mark near the middle, and another towards the tip of the wing; between these two marks the costal area is whitish: under wings ashy. Expands eight to ten lines.—*C. S. Gregson.*

Correction of an Error: Food of Melissoblaptes bipunctatus.—In my note on the habitat of this insect (Entom. iii. 154) I stated that the larvæ feed on the roots of *Ammophila arenaria*. Mr. Doubleday most kindly informs me that the larvæ of every species of this genus feed upon the nests of various bees: this accounts for their being found on one or two plants among a number, and only on those that contain a nest of a bee. They are never found in the same spot the second year. The female must live through the winter, as there are no bees' nests, at this late period of the year, in which to deposit their eggs.—*H. J. Harding*; 131, *Lower Street, Deal*, October 10, 1866.

Nepticula centifoliella at Cheshunt.—Mr. Stainton records, in the Ent. Mo. Mag. for October, that he has found, among some *Nepticulæ* bred from the larva by Mr. W. C. Boyd, of Cheshunt, several specimens of *N. centifoliella*.

Prior Appearance of Male or Female.—Some time since I said I would give the result of my experiments in this matter. The result is that I do not see that there is the least rule in the whole thing. I dare say most Entomologists knew this long ago. I find that a female of a batch of larvæ which went into pupa at the end of June is as likely as not to emerge before a male of a batch that went down the end of May, and *vice versâ*. In some species the male emerged first, in some the female; in all there were about an equal number of each sex. It seems to be a matter admitting of little interest, and still less use.—(*Rev.*) *E. Hallett Todd.*

Prior Appearance of Male or Female.—Having noted the time of appearance of the sexes of *Platypteryx unguicula*, *P. hamula* and *P. falcula*, I take the liberty of forwarding you the result, if the subject of priority of appearance of male or female is still of sufficient interest to find a place in the 'Entomologist.' *Platypteryx unguicula*: of this species I bred fifteen specimens (eight males and seven females): the sexes were so evenly represented that it is only necessary to

say that the first, a female, appeared on the 6th of May, and the last, a male, on the 10th of June. *Platypteryx hamula*: May 10th, one male; 30th, two males; June 2nd, two males; 4th, two males; 5th, three males, one female; 8th, one female; 10th, two females; 11th, one female, one male; 14th, one female. On examining my remaining seventeen pupæ I found the insects well formed, but dead, which I attribute to the unusual coldness prevailing at their time of appearance. *P. falcula*: I was supplied by a friend with some eggs of this species, which hatched in due course, and the larvæ were all full grown and spun up by the first week in July: on the 1st of August the first imago appeared; 2nd, one; Sept. 15, one; 16th, one; 18th, one; 21st, one: these six were all females and unusually large: as late as the 24th of October a male came out, followed by another on the 27th. The above results prove that in *P. unguicula* the sexes are equally represented at the time of emergence: in *P. hamula* the males are the first to appear, and in *P. falcula* the females are the soonest out. *Ennomos illustraria*: a female which I bred in May supplied me with about sixty fertile eggs: the young larvæ were placed altogether in a cage and fed upon birch; some of them grew rapidly and soon spun up, and in July I had four males and seven females of the variety *sublunaria*; at this period many of the larvæ were but half-grown: so that from the eggs of one female I had imago, pupæ and larvæ, as above mentioned. The remaining larvæ fed up well, and are now in pupa: a female has just emerged, which differs in no respect from those bred in May.—*William Machin*; 22, *Argyle Road, Mile End, November 1, 1866.*

Arctia fuliginosa semidouble-brooded.—I wish to add a word to the account of the life-history of this insect. It is semidouble-brooded. The second brood appears in August. I have this year reared eighteen larvæ from eggs from the spring brood. Half produced very fine imagos about the last days of August; the other half are hibernating, without spinning up, as full-grown larvæ.—(*Rev.*) *E. Hallett Todd.*

Economy of Agrotis aquilina.—The larva of *Agrotis aquilina* is a general feeder, like *A. Segetum*. Any one who possesses a garden, and has sown, in the spring, radishes, onions, cabbages or borecole, will find the young weeds that

spring up amongst them have been eaten by some larva : turn up the earth, and you will find the larvæ of *A. aquilina* : they will feed freely, and do well on the weeds amongst which you find them.—*Timothy Last ; Borough Road, Ipswich, October 16, 1866.*

Miselia Oxyacanthæ.—I have bred several specimens of this insect lately, and noticed, for about a fortnight before each specimen emerged from the pupa, that the eyes of the imago were visible, shining very brightly through the pupa-case. Is this usual with delicate pupæ?—*J. P. Barrett ; 29, Radnor Street, Hill Street, Peckham, London.*

Captures at Gas-lamps at Peckham, in September.—One *Camptogramma fluviata* and several *Ennomos fuscantaria*.—*Id.*

Macroglossa Stellatarum.—This insect was extremely abundant here last year, specimens having been observed from June until late in autumn. Not a single moth has been noticed this year. Can any reason be assigned for its absence? The pupæ of *Acherontia Atropos* were also, comparatively speaking, abundant in 1865, but are scarce here this year.—*H. M'Dowall ; Kettering, November 2, 1866.*

Captures at Bury St. Edmunds.—Among captures in the neighbourhood of Bury St. Edmunds during the past season, I have to record *Acontia luctuosa* (one), *Clostera reclusa* (abundant in the larva state), *Spilodes sticticalis* (abundant within a small space), *Melitæa Artemis* (abundant), *Brephos Parthenias*, *Fidonia piniaria* (abundant); larvæ of *Macroglossa fuciformis* (abundant), *Acidalia rubricata* (rare), *Macaria liturata* (rare).—(*Rev.*) *A. H. Wratislaw ; School Hall, Bury St. Edmunds, November 10, 1866.*

Captures at Ipswich.—My captures this year have been—*Nemeobius Lucina* 18, *Lycæna Ægon* 24, *Syricthus Alveolus*, *Macroglossa fuciformis* 15, caught at the flower of the common bugle and cow-wheat in June, *Sesia Apiformis* bred, *Zygæna Trifolii* 30, *Nudaria Senex* 13, *Lithosia complanula* 12, *Chelonia Plantaginis* 17 (all males), *C. villica* (bred), *Arctia mendica*, *Eurymene dolobraria* 1, *Acidalia promutata*, *A. immutata* (a few females), *Fidonia conspicuata* (common), *Melanthia hastata* 14, *Phibalapteryx lignata* (at light), *Endromis versicolor* (5 males taken flying), *Notodonta dodonæa* (bred), *Diphthera Orion* 9, *Leucania pudorina* 11, *L. comma*,

L. straminea 7, *Senta Ulvæ* 1, *Mamestra anceps*, *Apamea fibrosa*, *Agrotis valligera*, *A. aquilina*, *Noctua Dahlii*, *N. glareola*, *Cirrædia xerampelina*, *Brepha Parthenias* 50 males, *B. notha* 13 males. — *T. Last*; *Borough Road, Ipswich, October 13, 1866.*

Galls of the Sycamore. — A correspondent, who desires to be nameless, has forwarded me a leaf of the sycamore completely covered with pear-shaped excrescences on the upper side, and expresses a wish that I should say something about them in the 'Entomologist.' Familiar as I have been for very many years with these little currant-like bodies, I must confess my ignorance of their nature; but having applied to Mr. Armistead, I learn that they are said by Bremi to be caused by a four-legged *Acarus*, *Cephaloneum myriddeum*: any additional information on the subject will be thankfully received. — *Edward Newman.*

Ennomos Alniaria bred. — On a recent visit to Mr. Doubleday I had the gratification of seeing a most perfect and beautiful pair of *Ennomos Alniaria*, bred by Mr. Hellins, of Exeter, from eggs obtained last year at Gosport by Mr. Lacy. — *Id.*

Ennomos Alniaria at Deal. — On the 2nd of October I took a male of this rare species on a gas-lamp; it was not a fine one. This makes the third specimen I have taken on this coast, all near one spot. — *H. J. Harding.*

Chærocampa Celerio at Coggeshall. — Mr. H. Lawrence has captured a specimen of *C. Celerio*. He has also succeeded in finding and rearing the caterpillar of this species feeding on the vine. They were both found at Coggeshall. — *Charles Denny*; *Kelvedon, Essex, November, 1866.*

Emmelesia bifasciata near Preston. — Mr. Hodgkinson records, in the *Ent. Mo. Mag.* for October, the capture of about forty specimens of *E. bifasciata*; this was in the first week of August last: they were beaten out of an old hedge.

Leistus montanus in Scotland. — Mr. Blackburn records, in the *Ent. Mo. Mag.* for October, the capture of one specimen of *L. montanus*, on the summit of Schehallion, in July last.

Gelechia arundinetella at Lee. — Mr. Douglas records, in the 'Entomologist's Monthly Magazine' for September, that he found this insect in a swampy place at Lee, among *Carex riparia* or *C. paludosa*.

THE ENTOMOLOGIST.

No. 36.]

JANUARY, MDCCCLXVII.

[PRICE 6D.

The Irish List of Lepidoptera. By EDWIN BIRCHALL, Esq.

IN reply to the Rev. Joseph Greene's remarks (Entom. iii. 155), I must admit having intentionally omitted *Papilio Machaon* from my list of Irish Lepidoptera. I do not in the least doubt the accuracy of the three observations of the insect which Mr. Greene quotes, but I cannot think they justify us in considering *Machaon* as really indigenous. I have little doubt that, in all the instances, imported specimens had been set at liberty. I have myself turned out, in the neighbourhood of Dublin, many specimens of the insect, year after year.

Considering the almost nominal price for which the pupæ can be obtained at the birdstuffers' shops in London, and the ease with which they are reared, there can be no doubt large numbers have been from time to time imported into Ireland; and when the butterfly emerges, its beauty and singularly gentle and familiar ways plead so powerfully in its favour that its life is frequently spared, at least in houses where there are ladies to intercede for it.

The number thus set at liberty annually, in various parts of the country, must be very great; and as the food-plants are generally distributed, the wonder is, not that it has been three times observed at large in Ireland, but that it has not permanently established itself in many places, and may teach us how little we yet know of the causes which limit the range of a species.

In the 'Zoologist,' vol. iii. p. 944, will be found an interesting account of an attempt, by Mr. Wolley, to naturalize *P. Machaon* in Derbyshire; and although hundreds of specimens were turned out under very favourable conditions, the result was failure.

I did not erase the insect from the Irish list without a certain pang, but the compilers of local lists require to be

specially careful not to be misled by the common but most unphilosophical delusion, of imagining that a rich fauna is a credit to a country and a poor one a disgrace, and constantly to bear in mind that at best the discovery of a new species is the least fact in connexion with it.

Sesia culiciformis. — Omitted accidentally in copying the list. I possess specimens from Killarney.

Notodonta dromedarius, *var. perfusca*. — I have received specimens from Scotland barely to be distinguished from the Irish insect, which I think is merely a dark (northern?) variety of *N. dromedarius*. I have not met with the typical form of *N. dromedarius* in Ireland.

N. bicolor. — Doubt has been cast upon the native origin of the specimens said to have been captured at Killarney by the late Peter Bouchard. I can only say I saw two specimens in his hands there, which had certainly been alive within a few hours, and I do not know any ground to suspect a deliberately planned fraud; still the fact that the most determined search, year after year, by some of our best collectors, failed to produce further examples, was a discouraging circumstance, and, considering the temptation which the capture of so fine an addition to our native insects offered to a man in Bouchard's circumstances, perhaps justified the scepticism which has existed. I have, however, the pleasure of stating that Mr. John Hardy, jun., of Manchester, has this season captured a male specimen of *N. bicolor* near the spot which Bouchard pointed out to me as that in which he took the insect; and there is therefore now no reason why we should refuse to include the species in our lists.

Eupithecia subumbrata, *W. V. (piperata, Stephens)*. — I have taken this insect in some numbers on the wing near Galway in June, generally in the corners of rough pasture-fields amongst mixed herbage. I have met with the larva.

E. Virgaureata. — I omitted to give localities for this species. It occurs at Powerscourt, also at Killarney. I have frequently taken it on the wing, but never seen the larva.

E. arceuthata. — I possess a solitary example, captured on the wing, at Killarney, in 1862. It was named for me by the Rev. H. H. Crewe, who kindly presented me with English examples of the insect, with which it perfectly agrees.

E. innotata ; *E. expallidata*. — Given on the authority of the Rev. J. Bristowe. I have not seen the specimens in Mr. Bristowe's collection, and never met with either species in Ireland myself.

EDWIN BIRCHALL.

College House, Bradford,
November 6, 1866.

Notes on Aculeate Hymenoptera observed in 1866.

By FREDERICK SMITH, Esq.

For some years past I have annually published some record of discoveries and observations on the aculeate Hymenoptera : during the past season, not having enjoyed my usual good health, I have been unable to devote much time and attention to the subject ; but I think enough has been observed to make a short notice desirable, as I have also been supplied with information by some of my old and kind correspondents. There has also appeared, during the past year, a volume on the 'British Bees,' by W. E. Shuckard, whose volume on the Fossorial Hymenoptera, published in 1836, needs no commendation from me, it having been universally pronounced to be one of the most learned and complete essays ever published on the subject. This work appeared at a time when the author was ripe with his subject : thirty years have elapsed since the publication of that work, during which period the author has paid little or no attention to the Aculeata ; and consequently the volume on the 'British Bees' appears under very different circumstances, and can only be regarded as a work of compilation from the labours of more industrious Entomologists. Eleven years have elapsed since the publication of my own work on the 'Bees of Great Britain,' and during that period much additional information has accumulated, many discoveries have been made, and numerous errors and omissions detected : the recent work on the 'British Bees' is, as a matter of course, wanting in all these particulars ; whilst the information on the habits of the species is in a great degree derived from antiquated sources, the records of which modern investigation has proved to have been to a considerable extent imaginary.

I hope shortly to commence the publication of a complete revision of the British bees, in a series of chapters, when I will enlarge upon the economy of the different genera, and correct the errors of my former work. One or two insects observed during the past season, which I shall notice in this paper, will give me an opportunity of making one or two corrections of remarks that appear in the recent work on the 'British Bees.'

The season which has just closed upon our observations of the Aculeata has confessedly been one of the most unfavourable that we have experienced for some years past: nothing is more fatal to hymenopterous pursuits out-of-doors than wet weather, and, as the largest amount of it occurred just at the time when the Apidæ and Fossores are usually most abundant, the results were most disastrous: many species were not observed at all, and probably the Crabronidæ never appeared in such diminished numbers; Pompilidæ were extremely rare, even in situations in which they usually appear in vast numbers.

My own researches were entirely confined to the neighbourhood of Deal, than which I know of no more favourable locality for collecting the Aculeata: in order to accomplish this with the most desirable results the hymenopterist must extend his area of operations as far as Folkstone to the east, and to Sandwich on the west; his rambles inland, or to the south, need not exceed a distance of four miles: within this space two-thirds of the aculeate Hymenoptera, in favourable seasons, may be secured.

The range to the west of Deal will include the famous extent of sand-hills, a most prolific locality, in which I have worked during the months of June, July, August, September and October, and, consequently, am able to form a pretty correct estimate of the number of species to be taken there: thirty-three species of the family Andrenidæ, and this not, of course, inclusive of the early spring species of the genus *Andrena* proper, and forty-three species of the Apidæ, prove it to be one of the most fruitful localities in this country.

Early in June I paid my first visit to the sand-hills; a few species of Pompili were just appearing, as well as males of some of the summer bees; the universally distributed fossor (*Tachytes pompiliformis*) literally swarmed on every bare

patch of sand, and after the lapse of a few days the little *Megachile argentata* was burrowing in every hillock. This little bee was considered one of the greatest hymenopterous rarities thirty years ago, a single specimen being then considered a perfect treasure: the Rev. F. W. Hope occasionally captured a few specimens near Southend, and there also I first took the species, that gentleman having pointed out the locality to me; this is situated about a mile and a half beyond the town, at the termination of the low cliffs toward Shoeburyness; the viper's bugloss (*Echium vulgare*) grows there sparingly, and in that locality it frequented the flowers of that plant. At Deal, however, this little bee will be found to attach itself to the bird's-foot trefoil (*Lotus corniculatus*), and also, not unfrequently, to the *Trifolium arvense*: its burrows are lined with cuttings of different plants; at one time it selects the leaves of the rose, and at another those of the hare's-foot trefoil; and I have detected it cutting the circular pieces of leaf, with which it divides cell from cell in its tunnels, from the leaf of the buckthorn, which grows plentifully on the sand-hills. It is subject to the parasitic attacks of a species of Dipteron, I believe a *Miltogramma*, but, although I have bred many examples of the species, I have only twice obtained the parasitic fly; I have also observed *Cœlixys quadridentata* entering its burrows. This bee has been taken at Weybridge and at Sandgate by myself, and by Mr. Walcott at Burnham, in Somersetshire; Dr. Thwaites took it some years ago at Braunton Burrows, and I have seen a specimen or two taken near Rye, in Sussex; Mr. S. Stevens found it at Little Hampton, and Mr. Dale took it in Whitesand Bay, at the Land's End. Thus, although extremely local, it will be seen to be widely distributed. A reference to the notice of this species, in the work referred to on the 'British Bees,' will serve as an example of the poverty of information therein contained, when compared with our present knowledge of the *Apidæ*.

The type of the genus *Megachile* is *M. centuncularis*, and at Deal I have noticed a remarkable divergence from the usual habit of the species: in the street that runs parallel with the sea stands a brick house, very old, but tastefully decorated, the occupant having planted and trained up its walls a variety of climbing plants; the window-sills are

bright with pots of scarlet geraniums: numerous species of bees have located themselves in the walls of this ancient edifice, and none more numerous than *Megachile centuncularis*. In this house I was temporarily located some years ago, and at that time, to my astonishment, observed this well-known leaf-cutter selecting the scarlet petals of the geraniums wherewith to line its tunnels, perforated in the mortar of the old brick house. This year I again visited the spot, and found the geraniums cut for the same purpose. [See *Entom.* iii. 118, line 18.] Mr. Shuckard says this bee "makes use of the cuttings of rose-leaves, *not the petals*:" experience proves that none of the species confine themselves to the leaves of one plant; if rose-leaves grow near, those are most frequently used; but all the species vary their economy according to circumstances in this respect.

Prosopis dilatata is one of the most local of our native bees; it occurs occasionally at Walmer, where I captured a pair *in coitu*; I have also bred it from dock-stems found near Pakefield, in Suffolk: its female is the *Melitta annularis* of Kirby, a fact which I made known six or seven years ago; but the author of the 'British Bees' tells us, quite recently, that the female is not known. I may here also take the opportunity of correcting what my experience leads me to believe to be an error, put forth in the same work, wherein it is suggested that the genus *Megachile* pass the winter in the pupa state. My own opinion is that *no bee* could survive the winter in that stage of their transformations: all bees either arrive at a state of maturity previous to the winter months, or they pass through that inclement period in the larval state; in the latter condition they may be exposed to intense frost without detriment: I have subjected the larvæ of *Anthophora* to a degree of frost that rendered them capable of being snapped asunder; and yet such were in no way injured thereby, but on returning spring underwent their final changes.

If a colony of *Anthophora* be examined late in the autumn, bees in every stage of development will be found; but in early spring, before the bees come forth, only larvæ and perfect bees will be found to be living; many will be found to have perished in the pupa state, and also in an early stage of their perfect condition. I have obtained many species during

the winter months, but have never found a living pupa : I am therefore of opinion that bees can only survive the severity of our winter months in the larval and perfect state.

I am not aware of any addition having been made to the number of species of our native ants, but I have this year (1866) found *Formica aliena* very plentiful on the sand-hills at Deal ; and Mr. Bold has taken the rare *Myrmica lobicornis* near Newcastle. Dr. Sharp has taken workers of *Myrmedonia Latreillii* in Headly Lane, at Mickleham, where, he informs me, the species is tolerably abundant in moss and low herbage. *Ammophila lutaria* has been more numerous at Deal than I ever before observed it, whilst the two other native species, usually very abundant there, were comparatively rare : for the first time I detected *A. lutaria* with its prey, the larva of some species of *Noctua*.

I have scarcely seen any wasps during the season, and Mr. Bold informs me he has only noticed three workers in the north.

The pretty little *Ceratina cærulea* has been plentiful in the Warren at Folkstone during the months of July and August : this little bee is usually considered a rarity ; it is certainly very local ; I once found it as near London as Charlton, in Kent : I have captured it as late in the season as the 3rd of October, reposing in the flowers of a species of hawk-weed ; it is more frequently attracted by the flowers of *Echium vulgare*, but it also not uncommonly selects those of the common bramble. During my visit to Folkstone in October last, I collected a bundle of perforated bramble-sticks, and I find on examination that they contain the *Ceratina* in its perfect condition : the cells are merely separated by a thin partition, I think composed of the pith of the bramble-sticks, the tunnel being thinly coated with some glutinous secretion adapting it for containing the semi-liquid honey stored up by the bee. I am therefore of opinion that *Ceratina* always passes the winter months in the perfect condition : Dr. Thwaites has a memorandum in his private journal, "Found perfect examples of *Ceratina* in bramble-sticks at Stapleton."

On the 19th of October, so fine was the day, and so greatly had many species of *Apidæ* been retarded in their labours by the previous unfavourable weather, that I took the following species of *Andrenidæ* on the wing :—*Sphecodes gibbus*,

Halictus rubicundus, *H. cylindricus*, *H. albipes*, *H. flavipes*, *H. morio*, *H. villosulus*, *H. minutus*, and *Andrena Afzeliella*; males of several species of *Bombi* were also observed.

Three examples only were captured, at Walmer, of the beautiful *Andrena Hattorfiana*, the largest and handsomest of our native species of the genus: sixty-eight species of these bees are described, and about six remain to be added to the list; in the recent work by Mr. Shuckard fifty-two are said to inhabit this country: we are also told by the same author that "none of the *Andrenidæ* exhibit any positive colouring of the integument, excepting in some upon the abdomen:" this holds good as regards the species of this country, but a series, including all the known species of the genus, presents us with some having the thorax red above, one entirely of that colour, whilst others are adorned with tints of blue, varying in depth of colouring in different species.

The only bee remaining to be noticed is the *Osmia fulviventris*, which appeared in unusual abundance at Kingsdown, near Deal; it was frequenting the flowers of a species of hawk-weed. This bee usually burrows in posts and rails, but here I noticed it burrowing in an upright hard clay bank of a gravel-pit; I also observed *Stelis aterrima* entering its burrows.

Having been charged with robbing a brother Entomologist of his just rights to distinction, as being the first to capture a species of the genus *Osmia*, I will state here my own knowledge of the subject: the charge relates to the discovery of *Osmia pilicornis*.

This species was first taken by Captain Blomer; subsequently by Dr. Thwaites on the slopes of Durdham Downs: this gentleman distributed it among his entomological friends under the manuscript name of *O. pilicornis*: Mr. Walcott has also repeatedly taken it in Leigh Woods, near Bristol; and I once captured two examples at Birch Wood, Kent: these are all the captures with which I am acquainted. Mr. Bainbridge, who is said to have first taken it, was well known to me, and from him I have obtained several rare species of *Coleoptera*; but I never became aware of his having taken the *Osmia pilicornis*, and, if so, I feel confident that both Captain Blomer and Dr. Thwaites preceded him, and that the latter gave the manuscript name to the species,

which I adopted. I am still ignorant of the laws regulating the quotation of authors, and of their being binding on the adoption of manuscript names. In my first notice of the *Osmia pilicornis* I have stated that it was first taken by Captain Blomer.

FREDERICK SMITH.

British Museum, Dec., 1866.

Notes on the Habits of Epeira apoclisæ.

By FREDERICK SMITH, Esq.

ABOUT the middle of the month of August last I started for a walk over the sand-hills that lie between Deal and Sandwich: a considerable portion of the footpath runs along the side of one of those ditches which, in a sort of labyrinthine net-work, intersect the vast tract of meadow-land that stretches out in level extent as far as the ancient city of Canterbury. These ditches are the resort of many species of Hydradephaga, but on the occasion referred to I was not bent on entomological pursuits. A great variety of water-plants are to be found in these ditches, and in former years I have taken *Donacia crassipes*, *dentipes*, *nigra* and *Menyanthidis*, as well as *Eirrhinus Festucæ*, *schirrhosus*, *Gymnætron Beccabungæ*, and *Grypidius Equiseti*: these and many other good Coleoptera have I found there. Clumps of rushes grow here and there along the banks of the ditches, and I had sat down close to a clump, when my attention was attracted by numerous small dome-shaped nests of white silk: these I noticed were principally attached to the clusters of seeds which grew towards the top of the rushes. Numerous sheep were grazing about the spot, and close to the clump of rushes that grew about a yard from the spot where I was sitting a little heap of dung was deposited; this of course attracted certain species of Diptera. Suddenly I observed a spider drop from one of the dome-shaped nests; down he dropped like a pebble on to the little heap of sheep's dung: the spider had caught a fly. This was a mode of capture I had never before witnessed; I admired it exceedingly, but my astonishment was increased twentyfold on seeing him, exactly like one of those balls attached to an

elastic string with which children amuse themselves, ascend hind-quarters first! The spider had no elastic string? if not, how he did he contrive to rebound like a ball? Was the silken thread retracted? I observed no motion in his legs.

The circumstance altogether so greatly interested me that I immediately set about laying baits for flies beneath other of the dome-shaped nests. Subsequently I was gratified by witnessing three similar captures and three similar ascents; but I failed to detect any perceptible motion of the spider's legs, which I think I must have done had the creature climbed backwards up the thread: the rapidity with which he ascended appeared to render such a mode of ascent impossible.

I secured three or four of the nests, and brought them to London, in the hope of establishing so interesting a spider in my own garden; I attached two nests to shrubs for that purpose, but reserved one, intending to examine the species more minutely, and to ascertain its name. I was, however, compelled by the state of my health to leave town immediately, and I forgot the poor spider imprisoned in the pill-box.

Six weeks afterwards, on my return to town, I remembered the captive, and on opening the box I found a swarm of young active spiders, and six dead specimens of *Pezomachus fasciatus*: the only remains of the spider were its legs, and portions of the cephalothorax and the falcēs. Had the young spiders fed upon their parent? I can scarcely lay this charge of cannibalism on the *Pezomachus*. I have repeatedly bred the same *Ichneumon* from the nests of *Agelena brunnea*, and these certainly did not contain the parent spider; yet from these I have obtained young spiders, together with *Ichneumons*, from the same nest: when this happened seldom more than four of *Pezomachus* and about half a dozen spiders. I therefore must conclude that the young spiders were the culprits.

I have submitted the nests and young of the spider to the Rev. O. Pickard-Cambridge, who informs me that he has little doubt of their being those of *Epeira apoclisia*.

FREDERICK SMITH.

Life-history of Pterophorus lithodactylus. — The larva feeds in May and June on the leaves of *Conyza squarrosa*, sometimes quite defoliating and thus destroying the plant; it is somewhat onisciform, of a light whitish green colour and hairy; when full-fed it is about six or seven lines in length, with a broad pinkish dorsal stripe; the head is obtuse and the anal segment narrow. Pupa hairy, the head and wing-cases green, the abdomen lighter green with a pinkish tinge, suspended by the tail: the pupa state lasts about fifteen days, when the perfect insect appears. Antennæ rather long and very slender; head dark; thorax ashy; fore wings ashy, clouded with brownish purple or pinkish, with a dark patch on the costa; above the base of the first cleft is a light mark; then another dark costal mark, and frequently two or three dark marks on the first feather; below the first costal mark is a somewhat cuneiform mark, edged at its broad or outer end with whitish; hind wings ashy; abdomen with a double mark on each segment; legs long, rather strong; wings in repose folded, held horizontally. This is another species which is useful to man, living as it does on a noxious weed which so abounds in some lime-stone sheep fells in North Lancashire and in Westmoreland, that anything which has a tendency to check or destroy it must be esteemed useful; for although the husbandman may work ever so hard in extirpating the low-growing plants, he is powerless on the rock-faces and narrow ledges from whence the seeds are being regularly scattered; but here we have one of Nature's agents, an insect which so consumes the leaves that the plant dies, and useful herbage springs up where once a wide-spreading and useless plant encumbered the ground. I may remark incidentally that I have selected instances of useful insects from those whose life-history is either unknown or imperfectly known: I do not know a single species of the genus *Pterophorus* that feeds upon a useful plant, although, in England, *Pterophorus rhododactylus* feeds on, but does not destroy, that most ornamental garden plant, the rose. — C. S. Gregson.

Life-history of Pterophorus osteodactylus. — Larva delicate pale brown, with five darker longitudinal stripes; rather stout in the middle, but attenuated at both ends: it feeds upon the flowers and seeds of *Solidago Virgaurea* (golden

rod): it lives through the winter, and spins up in the spring, appearing in the perfect state in July and August. The perfect insect has the head, body and upper wings sulphur-yellow, in fine specimens slightly darker on the costa, and having a darkish elongated patch beyond the middle; the under wings darkish ash-coloured; abdomen and legs light sulphur-yellow. Expansion of the wings from eight to ten lines. This insect may be said to be useful to man, as it lives entirely upon a useless plant, which grows so abundantly and seeds so freely that without such checks it would soon cover the ground, which would otherwise be covered with useful food for animals.—*C. S. Gregson.*

Entomological Notes and Captures.

Inquiry respecting Galls.—I am told that *Cynips ventriculus*, *C. Tiara*, *C. lenticularis* and *C. Castaneæ* are described by Curtis in vols. i., ii., iii., iv. and v. of the 'Gardener's Chronicle:' I shall be glad to know what galls they produce, as I have failed in obtaining the volumes mentioned. Withering, when attempting to enumerate the insects of the oak, mentions *Cynips Quercus-Baccæ*: what gall can produce this? I also wish to know what gall produces *C. Quercus-Petioli*, mentioned by Withering: a specimen in my own cabinet is thus labelled.—*H. Waring Kidd; Godalming.*

[I know nothing more of this than that such a paper by Mr. Curtis exists, and is intituled "Economy and figures of *Cynips aptera*, *ventriculus*, *Quercus-Tiaræ*, *lenticularis*, *Quercus-Pedunculi*, *Quercus-Ramuli*, *Quercus-Castaneæ*, *Quercus-Folii*, and *Quercus Petioli*:" such papers should be published in Natural-History Journals.—*E. N.*]

Are there three Species of Artichoke Gall-makers?—There seems little doubt that *Cynips Quercus-Gemmæ* and *C. Fecundatrix* are distinct species. *C. Celas* is said to attack the cupule of the oak: can this be a third artichoke gall-maker, or is it synonymous with one of the above-named?—*Henry Waring Kidd.*

[I know but one artichoke-producing gall, *Cynips Fecundatrix*.—*E. N.*]

Galls of Aphis bursaria.—In 'Kirby and Spence' it is

stated that *Aphis bursaria* forms a gall on the leaf-stalk of the black poplar: is that on the Lombardy poplar caused by the same insect? I find swarms of a bluish *Aphis* in those of the Lombardy poplar.—*Henry Waring Kidd.*

[Mr. Walker believes that the galls of both the Lombardy and black poplar are produced by *Aphis bursaria*.—*E. N.*]

Do Bombyx Rubi, &c., breed in Confinement? — Are any instances known of *Bombyx Rubi*, *Saturnia Carpini* or *Chærocampa Elpenor*, bred in captivity, pairing and producing fertile eggs? — *H. M'Dowall; Kettering, November 28, 1866.*

Captures at Northleach.—In addition to the insects already named (*Entom.* iii. 167), I have taken this season four specimens of *Agrotis pyrophila* and *A. aquilina*, at sugar; and two specimens of *Agrotis cinerea* and *Luperina cespitis*, at light.—(*Rev.*) *E. Hallett Todd; Aldsworth Parsonage, Northleach, November 23, 1866.*

Phycis adornatella, &c.—I learn from Mr. Doubleday that Mr. Gregson's *Phycis*, captured in the Isle of Man, is *P. subornatella*, and totally distinct from *P. adornatella*, the two species being incorrectly combined in the Museum Catalogue. In corresponding with Zeller that able Entomologist observes that *subornatella* inhabits exposed barren places, while *adornatella* is found in grassy places where the wild thyme grows.—*Edward Newman.*

Reported occurrence of Xylina Zinckenii at New Cross.—A single specimen of this insect, the *Noctua Lamda* of Fabricius (*Mantissa Ins.* p. 174, No. 257), is reported to have been taken by Mr. Harrington, on the trunk of a willow tree, near New Cross, on the 30th of September last; but in my correspondence with Mr. Doubleday I find that eminent lepidopterist has not seen the insect, so some doubt must attach to the name for the present. Herrich-Schæffer gives two very beautiful figures of the species ('*Noctuides*,' tab. 28, figs. 135 and 136), but both this author ('*Schmetterlinge von Europa*,' ii. 305) and Guenée ('*Noctuelites*,' p. 119) give it the name of *Zinckenii*, and sink the Fabrician name of *Lamda* as a synonym, the last-named Entomologist thinking it "unlikely that Fabricius should have known a species that must have been rare in his time." The fore wings are bluish gray, variegated with both lighter and darker markings, the

ground colour being lighter than in *Xylina conformis*, and the dark markings being thus rendered more conspicuous. It is also smaller than *Xylina conformis*. Nothing is known of its larva or life-history, except that it occurs as far north as Sweden, and also in the North of Germany, both in autumn and spring; so that it must either hibernate in the perfect state or pass through two generations in the year.—*Edward Newman*.

Supposed Preponderance of Male Brephos.—I see (Entom. iii. 189) that some of your correspondents have taken a large number of the males only of the genus *Brephos*. I have not often sought for these insects, but have always taken as many females as males. My entire numbers were, however, much smaller, and I never used a long-poled net. Let your correspondents solve the problem by the exercise of a little ingenuity.—(Rev.) *A. H. Wratislaw*; *School Hall, Bury St. Edmunds, December 13, 1866*.

Double-broodedness of Nemeobius Lucina, Eupithecia fraxinata and E. lariciata.—At the beginning of the summer of 1865 I reared broods of the three insects above-mentioned from the egg: the larvæ grew up and assumed the pupa state very rapidly, and I put them in a cupboard, not thinking they would emerge till the following spring. I had previously bred all three species, but not a single imago had appeared till the following spring. In October I looked into the boxes, and, to my surprise and annoyance, found that, with two or three exceptions, all the perfect insects had emerged, and were dead and dry.—(Rev.) *H. Harpur Crewe*; *Drayton-Beauchamp, Tring, December 10, 1866*.

Answers to Correspondents.

G. Garrett.—The insects sent are *Selenia illunaria*, the summer brood called *Juliaria* by Haworth; and *Eupithecia rectangulata*, the larva of which does such great injury to our orchards by devouring the apple blossoms.

G. Timbs.—The moth is only a variety of *Oporabia dilutata*, notwithstanding the beautiful bar across its wings: there is but one species of the genus detected in the South of England.

THE ENTOMOLOGIST.

No. 37 & 38.] FEBRUARY, MDCCCLXVII. [PRICE 1s.

Irish Insect-Hunting Grounds. By EDWIN BIRCHALL, Esq.

I. THE HILL OF HOWTH.

This noble headland, stretching eastward into the Irish Channel, forms the northern arm of Dublin Bay: the name is supposed to be derived from the Scandinavian word "Hoved," a headland, given to it by the old Danish conquerors of Dublin.

It is about four miles in length, with an average width of two miles: to the sea it everywhere presents a wall of rugged and almost inaccessible cliffs, above which are sloping mountain-pastures, gradually rising into a central heath-clad mass, of about six hundred feet in height.

The greater part of Howth is uncultivated, and comprising within its bounds almost every variety of surface: it is a perfect little entomological paradise of bog, swamp, sand-hill, wood, moor and mountain; and, thanks to the liberality of the noble owner, the Earl of Howth, there is not a single "Notice to Trespassers" on his property.

The promontory is connected with the mainland by a low sandy isthmus, at its narrowest part only a couple of hundred yards across, and raised so little above the sea-level that a winter's storm might almost sweep away the frail barriers, and Howth again become the island it was in the carboniferous sea.

For a moment let us glance back to that immeasurably distant epoch, and consider the marvellous story which Geology has revealed of the past history of Howth,—how the ancient island sank beneath the sea, inch by inch, enveloped in a stony shroud, descending to unknown depths: countless ages pass,—countless truly, for who can estimate or even imagine the period required for the accumulation of the whole series of the secondary rocks, and during their deposition Howth was certainly beneath the surface?—but at last

an upward movement commences, sheet after sheet of limestone rock is swept away as it approaches the surface and comes under the wearing action of the waves, and finally old Howth again beholds the sun, and is peopled with new forms of life.*

It seems, however, to have met with only a cold reception on its second advent, having apparently emerged during the glacial period: thick accumulations of drift, sand and clay may be seen in the cliffs on the northern shore, and the rocks of the higher portions of the hill are grooved and polished, no doubt by the action of the icebergs which grounded on the rising shores.

Along the southern cliffs, a hundred feet above the sea-level, an old sea-beach, probably of the glacial period, may be traced; it is loaded with shells, almost in a recent condition.

From the elevated central portion of the hill the view is magnificent: on a clear day the eye ranges from the Mourne mountains, far to the north in the County Down, to the heights of Snaefell in the Isle of Man; thence to Snowdon on the distant eastern horizon; to the south, Wicklow Head; and the picturesque outline of the Wicklow mountains completes the circle to Bray Head, frowning across the broad expanse of Dublin Bay.

About three hundred species of Lepidoptera are known to occur at Howth, but there is no reason to think that this comprises anything near the total number which might be found, as, except during the three summer months, little collecting has been attempted, and two of the most productive methods for the capture of Lepidoptera (sugar and light) can only be tried by stealth. The cliffs are the chosen parade-ground of the coastguard, and the hapless Entomologist, upon whom a big Irishman, armed with cutlass and pistols, pounces from behind a rock, finds it as useless to argue with

* "Howth Hill, having been an island in the carboniferous sea, was surrounded by beds of limestone deposited against its shores, higher and higher beds touching those shores as the island sank in the sea, until it was possibly entirely entombed in the limestone. It has since been re-elevated and partially exhumed by denudation, but there is no evidence to show that the contour-line, now at the sea-level, was the original base of the old island." — J. B. Jukes, *Explanations of the Geological Survey of Ireland*.

him as with the master of a hundred legions, and may think himself fortunate if, by the sacrifice of his lantern, he escapes spending the rest of the night in the lock-up.

The butterflies are poorly represented, only ten species having been observed, *viz.*, *Napi*, *Aglaia*, *Megæra*, *Semele*, *Janira*, *Pamphilus*, *Urticæ*, *Atalanta*, *Cardui*, *Alexis*.

The *Sphingidæ* are still fewer in number—*Porcellus*, *Stelatarum*, *Filipendulæ* and *Bembeciformis* being the only ones yet noticed.

The following list comprises a few of the rarer *Lepidoptera* found on the Hill:—*Lithosia caniola*, *Ellopia fasciaria*, *Eupithecia constrictata*, *Luperina cespitis*, *Mamestra furva*, *M. albicolon*, *Agrotis lunigera*, *A. obelisca*, *A. agathina*, *A. præcox*, *A. lucernea*, *Dianthæcia capsophila*, *D. Cucubali*, *D. Barrettii*, *Dasypolia Templi*, *Epunda lichenea*, *Hadena adusta*, *Stilbia anomala*, *Spilodes sticticalis*, *Sericoris littorana*, *Dicrorampha senectana*, *D. simpliciana*, *Catoptria parvulana*, *Sciaphila Colquhounana*, *Eupæcilia albicapitana*, *E. hybridellana*, *Argyrolepis cnicana*, *Cochylis Francillana*, *Tinea confusella*, *Depressaria capreolella*, *Gelechia leucomelanella*, *G. Tarquiniella*, *Ægoconia quadripuncta*, *Elachista perplexella*, *E. triseriatella*, *Nepticula acetosæ*. Of the foregoing, nine species deserve special notice, as additions to the list of our native insects contributed by this locality, *viz.*, *Lithosia caniola*, *Dianthæcia capsophila*, *D. Barrettii*, *Eupæcilia albicapitana*, *Tinea confusella*, *Gelechia Tarquiniella*, *G. leucomelanella*, *Elachista triseriatella*, *Nepticula acetosæ*: of these only the three last-named are certainly known to occur in Great Britain, and *D. Barrettii* and *G. Tarquiniella* have not yet been observed anywhere except at Howth.

Naturalists ought to abound in Dublin, if they could be developed by favourable circumstances, for Nature, in her most charming dress, is at their very doors.

The cliffs of Howth, and of the neighbouring islands of Ireland's Eye and Lambay are the resort of innumerable birds. Seals abound on the coast, breeding in the caves at the base of the cliffs, and their round heads may constantly be seen emerging from the water and peering about, looking like great dogs without ears; and all this within half an hour of the metropolis of Ireland.

Indeed, to whatever branch of Natural Science a man

devotes his attention, at Howth an ample field for its study may be found; and after a day spent there, even though no discovery has attended his researches, the true lover of Nature will return to his allotted post in the world with the sure reward of increased serenity of mind, perhaps with a deepened sense of his own ignorance and littleness, but with higher and more worthy conceptions of the wondrous universe of God.

If the visitor to Howth has antiquarian tastes, he will find much to interest him. The detached conical rock on which the Bailey Lighthouse stands was formerly crowned by the fortress of King Crimthann, celebrated in early Irish history: he is said to have died in the ninth year of the Christian era, and his sepulchral cairn is still pointed out on the summit of Slieve Martin. Two lines of ancient fortification, each consisting of a mound and fosse, enclose the narrow end of the promontory, and the lighthouse rock at the extreme point: here the Danes, after their defeat at the Battle of Clontarf, in the year 1014, are said to have fortified themselves, and held out until carried off by their vessels.

At the foot of Carrick-More there is a cromlech which is worth a visit, and in the village of Howth a fine ruined abbey of the twelfth century.

About a mile to the north of Howth lies the rocky island of Ireland's Eye: it contains little to tempt the naturalist specially, being principally pasture-land; but there are curious monastic ruins, said to date back to the sixth century, and it was the residence of the Irish Saint Nesson, of whom the following story is recorded in Colgan's '*Acta Sanctorum*,' in explanation of the rude outline of a human figure on a detached cliff, called Puck's Rock, on the northern shore of Howth.

Saint Nesson was assailed on Ireland's Eye by an evil spirit of frightful aspect. The saint by good fortune was reading the holy book called '*The Garland of Howth*:' as his enemy approached he struck him with the book, and drove him with such force against the opposite coast of Howth that the evil spirit was firmly fixed in a fissure of the rock, where he has now remained for twelve centuries, vainly struggling to extricate himself.

There are several hotels in the village of Howth, but if the

visitor can put up with plain food, and likes to be free from all manner of restraint, and close to the best collecting-ground, he will find the 'Bailey Tavern,' at the summit of the south cliff, very convenient quarters, and the charges less than half those of more pretentious establishments. The windows command a glorious view of Dublin Bay and the Wicklow mountains, and acres of cliff glowing with the crimson and yellow blossoms of *Geranium sanguineum* and *Lotus corniculatus*.

EDWIN BIRCHALL.

Bradford, Dec. 1, 1866.

Variation in Lepidoptera. By C. S. GREGSON, Esq.

THERE seems to be a growing interest in this long-neglected, but most interesting, phase in Lepidopterology. I think the terms "aberrant form," "abnormal form," or "variety," used indiscriminately, cannot be defended; yet in Lepidoptera, which so often "sport," as botanists would say, it will be found difficult, in practice, to speak correctly if we adhere too closely to the proper terms; and as many of our very best Entomologists are not scholars, I fear we cannot expect to get the information we want, if we lay down a strict rule to be applied to each—shall I say variety, or shall it be aberration? If the first, then I take it "variety" should apply to a series of specimens which are allied to, but different in size, colour, shape or marking from, a well-known type, it may be from different localities or in different seasons; if the second, then we should apply "aberration" to most insects which are now called varieties; and this word would be proper to apply to a "fine variety" of *Vanessa Urticæ* in the possession of Mr. Ingall, for it is evidently an abnormal or aberrant form of this abundant, yet in England generally constant, species; I say in England constant, because the Corsican variety? *Vanessa Ichnusa* (without the two central spots), is not, in Corsica, a scarce form; yet after passing my eye over at least a thousand bred specimens nearly every year for the last twenty years, I never met with an English specimen of this form until last year, when I obtained one captured by a little girl at Hawkshead, in North

Lancashire, which is so like a pair of *V. Ichnusa* presented to me by Mr. Doubleday that I feel constrained to call it variety *Ichnusa*; whilst several strange abnormal specimens of the same species, in my British collection, must of necessity be called aberrations: personally I am not inclined to be very particular as to which word is used; I think I know which is meant thereby; and as the term variety has of late years become so generally used, I fear we shall have to use it for the sake of convenience, if for nothing else. In *Coleoptera* I quite understand how well this applies to "various aberrations from their peculiar type, which are sufficiently constant and isolated in their general character to appear, at first sight, to be distinct from it;" and this often applies to *Lepidoptera* from distant localities; for instance, I have specimens of *Papilio Machaon* from the Swiss Alps which only measure two inches and six lines in the expansion of the wings, and differing considerably in the nerval markings, especially on the hind wings, whilst my British specimens reach three inches and six lines in the expansion of the wings; again, *Pieris Rapæ* varies somewhat in England, but on the Swiss Alps it is darker and more suffused, and becomes variety *Bryoniæ* of Godart; and this might be carried much further, but as the term variety has become so general when applied to any differentiation in our British specimens, we may well be excused if, in describing our varieties or abnormal forms, any of us use the wrong terms.

Years ago Mr. Curtis and Mr. Dale wrote me on the advisability of having our varieties figured and published, so that we could all have copies of unique forms; and whilst the Entomological Society of London has been sleeping, the provincial Entomological Society of Lyons, in France, has been doing this work beautifully, as may be seen in Millière's 'New, Little-known and Aberrant Forms of *Lepidoptera*,' published at Paris, from the Lyons Society's 'Transactions,' a copy of which Mr. Doubleday has recently most kindly lent me for perusal. Premising that this question of variation of species is now fairly opened, I give the list of abnormal forms in my collection.

Papilio Machaon. Two specimens having a dark dot in the second mark of the central band: the yellow of one of these is much darker than is usual in British specimens. Bred.

Pieris Rapæ. Two specimens immaculate, two almost so. Three cream-coloured and well-marked. Bred.

P. Napi. One female, measuring one inch and three lines in expansion of wings, and of a dark colour. Obtained by purchase.

Anthocharis Cardamines. One male, light lemon-colour where it ought to be white. Obtained from a man at Southport.

Leucophasia Diniensis, variety? *Bdv*. Five males, two females: this is said to be the second brood of *L. Sinapis*. In the lake districts of North Lancashire, *L. Sinapis* abounds in May, but as yet I have never seen a second brood there. My specimens were all obtained, by purchase, from the collections of working Entomologists around London. This insect may always be known by the round blackish (not square grayish) spot at the tip of the wing, through which two distinct white nerves pass, and by the under side being almost devoid of suffused markings. One female immaculate, very fine.

Chrysophanus Phlæas.—This species has had my especial attention for many years, and the result is a long row of aberrations; one with small spots on the superior wings, and a broad red band on the under wings; one dull brownish; six without under-wing markings; one very large, with red pencil-like streaks on the nerves of the under wing; one with one silver upper wing, all else proper; one with both upper wings silvery, the under wings proper; six with all the copper-colour turned to silver,—one of these is truly magnificent. Many of these have been given to me by friends who captured them; others obtained by purchase, or captured or bred by myself.

Polyommatus Ægon. One “gynandromorphous,” having one side male and the left side female. Obtained, by purchase, from Mr. Hodgkins.

Nemeobius Lucina. One female, having the inner markings of the under wings white instead of the ordinary colour. This is the only aberration worth notice I ever saw in this species.

Melitæa Artemis. Of this variable species I have specimens from one inch and two lines in expansion to one inch and ten lines. Captured in Lancashire, and varying much in depth of colour.

M. Athalia. One female, very dark for the first half of the wings, then a light band through them, afterwards dark green. Taken at Burnt Wood, Staffordshire.

Argynnis Euphrosyne. One male, very light buff instead of the usual colour, in fine condition; purchased from King. One dark-marked female, with the hind wings blotched; purchased from Mr. Hodgkins.

A. Adippe. One female, with the first basal costal mark distinctly defined in a dark patch which extends to the end of the discoidal cell; hind wings dark brown, suffused to the cilia lunules, where it dies out. This specimen is perhaps the most magnificent aberration I ever saw of any species: it was captured at Burnt Wood, Staffordshire, and obtained by purchase.

A. Aglaia, variety *Charlotta*. Three specimens, captured at Bootle by myself.

A. Paphia. One specimen, on the right-hand side blotched with dark brown patches; on fore and hind wings shaded off towards the outer margin, which is light and quite without the ordinary lunules; on the other side there is an oblong brown patch filling the "humeral" space, then a central ziczac fascia-like marking; afterwards the two outer rows of spots join and form long dark patches, and on this wing the cilia markings are well defined; and the under wing differs from the other in having a narrower suffused patch through the centre: altogether it is a strange blotched specimen. Obtained, by purchase, from Mr. Hodgkins.

Vanessa Atalanta. One specimen, having a small white spot in the red band on each side, one having a large light patch on the red band on each side; and two specimens in which the red band is broken through the centre. As this and the following species are said never to vary, even these slight aberrations are interesting.

V. Io. One specimen, ordinary fore wings, hind wings having large light patches, in the centre of which there are two small twin dark spots. A most striking example, presented to me by Mr. Johnson: it was captured by a Wigan collier at Southport. One specimen having a distinct dark discal patch, obtained as a present from a friend. Three magnificent specimens, upper wings as in ordinary specimens on the under wings; the eyes are very large, black as

Erebus, and entirely without the blue lustre so beautifully depicted on the upper eyes: presented to me by Messrs. Tiltman and Nicholson, of Whitehaven, by whom they were bred.

C. S. GREGSON.

Stanley, near Liverpool.

*Heliothis armiger** and the Army-worm.

By ALBERT MULLER, Esq.

IN reply to Mr. Newman's inquiry (Entom. iii. 167) for reliable observations on the life-history of the European *Heliothis armiger*, I may state that probably they are yet to be made; however, I am happy to supply at least one scrap of information, which will perhaps put British Lepidopterists on the right track. Herr Dietrich has published, in the *Mittheil. der Schweiz. Entom. G.* (vol. i., 1864, p. 258), a note, in which he says that Professor Heer, of Zueric, received, in the course of the summer of 1864, a few larvæ from Malans, in the Grisons, accompanied by a memorandum that they had been found on maize (*maiskolben*). Professor Heer fed them with maize-grains, and succeeded in obtaining pupæ. In or about the middle of August he handed to Herr Dietrich a box containing a fully-developed imago, but dead and in wasted condition; so that it could not be determined whether it belonged to *H. peltiger* or *H. armiger*. However, the box contained another pupa, which produced, towards the end of August, a specimen turning out to be *H. armiger*. Herr Dietrich further states that, according to Freyer, the larva lives on *Reseda lutea*, but that it was not known when Treitschke wrote his work, his description having been drawn up from caught specimens.

The essence of the preceding notice has already been laid before the English public in the 'Zoological Record' (vol. i. 1864), a work the usefulness of which would be much increased if future years should see it appear in two or more separate parts.

* Not *armigera*, Zeller having long ago pointed out that *Heliothis* is masculine ('Isis,' 1840, p. 246.)

That *Heliothis armiger* is distributed over the whole South of Europe, Southern Asia, Africa, New Holland, and North and South America, is a well-known fact, but scarcely comes within the scope of these lines, as Cowper's words,

"The theme a worm!"

would most likely be a fitting title for the preceding as well as for the following remarks, which tend to show that, although we are fully informed about the perfect insect, we cannot say so much with regard to the larva said to belong to it, and commonly called the "army-worm," inasmuch as there exist apparently well-founded suspicions that this name (like "wire-worm" amongst the Coleoptera) has to do duty for several species, and at all events for more than one kind of destructive caterpillar.

It rests with American Entomologists to inform us whether the real "army-worm" belongs to *Heliothis armiger* of Hübner, as is generally supposed, or to *Noctua xyliua* of Say, as stated by this author in his 'Correspondence relative to the Insect that destroys the Cotton-plant' (last reprinted in 'The Complete Writings,' &c., of Thomas Say, ed. Leconte, 1859, vol. i. p. 369—371), by Miss Morris, in the 'American Agriculturist,' and also in Harris's 'Insects Injurious to Vegetation' (ed. Flint, 1862, p. 457). But curiously enough the Appendix of the work last mentioned contains an account, compiled from various "authentic" sources, referring the very same "army-worm" to *Leucania unipunctata* of Haworth, which is synonymous with *L. extranea* of Guenée and with *L. impunctata* of Stephens, together with figures of the larva, pupa and imago, and also of two Ichneumons preying on the first.

Several other papers on the same subject have been published by Burnett in the 'Proceedings of the Boston Natural History Society' for 1854, and still more important ones by T. Glover in the Reports of the Committee for Patents, published at Washington in 1858 and 1859; but enough has already been brought forward to show that more than one enigma awaits solution in this inquiry.

Reasons similar to the above will probably always prevent us from being able to say with certainty to which species of moth the earlier American records of the appearance and

destructive habits of army-worms are to be referred, but I have a notion that, if the reports from sundry quarters were carefully sifted, it would turn out that more than one species has to plead guilty of having had, or of still having, a share in these terrible visitations, notwithstanding the almost universal presence of *H. armiger*, a circumstance which most likely has caused it to become the scapegoat for all its mischievous relations in the cotton-growing countries of both hemispheres.

The extract from the 'Liverpool Mercury,' for which we are indebted to Mr. Birchall's kindness, is most useful for the comparison of the description of the army-worm, of which it treats with descriptions of the same or similar larvæ published elsewhere; but unfortunately it leaves us quite in the dark as to the locality or even state wherein the said caterpillar occurs: if this desideratum could be supplied it would be a valuable assistance to future inquirers.

In reply to Mr. Birchall's query (Entom. iii. 167), I may say that although, in the complete absence of reliable data, I cannot refute the statement that this army-worm requires only eight or nine days to be full-fed, I prefer to place small confidence in this entomological "canard" until some trans-Atlantic brother of the net and pin will condescend to replace the vague folklore of the cotton-market, by carefully watching the insect through all stages, and report fully on the same.

ALBERT MULLER.

December 17, 1866.

Habits of Epeira apoclisa. By the Rev. O. P.-CAMBRIDGE.

MR. FREDERICK SMITH's communication (Entom. iii. 199) on the habits of *Epeira apoclisa* has interested me very much. As Mr. S. observes, he kindly submitted the nests and young spiders to me, and I had but little hesitation in referring them to that species, *E. apoclisa*, *Walck.* In our conversation upon the subject I do not remember Mr. Smith's having stated his conclusion that the young spiders had devoured their parent. I believe I said myself that the evidence seemed to prove that the adult spider, the parent, had

been previously stung by the Ichneumon, *Pezomachus fasciatus*, and that their development, and consequent appearance in the perfect state, would quite account for the mere fragments of the parent that remained.

I do not think for a moment that the young spiders could have been capable (not perhaps from want of will, but from want of power) of devouring a mature individual. The young spiders which I saw—some dead, two alive—were evidently not long from the egg; and at this stage of life their food seems to be, in some species certainly, but little more than mere moisture; probably in no case do they feed on other than the smallest, tenderest insects.

With regard to my supposition that the parent spider had been stung by the parent *Pezomachus*, I have certainly never heard of spiders in the perfect state being subject to the attacks of Ichneumons, and I believe Mr. Smith said no instance of it had ever come before him; but I do not know any *à priori* reason why they should *not* be liable to those attacks. The large number of young spiders that appeared in Mr. Smith's box shows, I think, that the eggs alone could hardly have sufficed for the food of the larvæ of *six* of the *Pezomachus*; and this would seem to compel us to resort to the supposition of some of them having been bred out of the parent spider.

I have frequently observed the simple but very striking mode of spiders capturing their prey, by dropping upon it like a stone, that Mr. Smith speaks of, but not before in *E. apoclis*; in several instances I have seen it in *E. inclinata*, *Walck.*: in these instances the spider reascended to its original position by running up its thread backwards: I could see a quick motion of the legs, and although unable, from the position I was in, to be *quite certain*, yet from what I could see I concluded that the slack of the thread was gathered in by the hind legs as the spider ascended: the ascents that I have observed were not so rapid or instantaneous as those Mr. Smith describes, but I think that a very rapid movement, of the *extremities* merely, of the legs used in climbing, might be difficult to see during so short a time as the operation lasted, but would account for the swiftness with which the ascents were made.

Epeira apoclis, *Walck.*, is one of our most numerous as

well as most beautiful spiders: it is generally found among rushes, &c., on the margins of ponds, brooks, rivers, and in marshy places. Another more local but closely-allied species, *Epeira patagiata*, *Koch*, is found in similar situations, but, as yet known, is rare in England compared to its congener, *E. apoclista*. *Epeira sericata*, *Koch*, is very nearly allied to both the above species, but hitherto I have only found it, in England, on the old walls of the city of Chester. In South Germany I found it frequently, spinning its webs in the angles of the wood-work of bridges, &c., but never (as stated by Mr. Blackwall, *Brit. and Ir. Spiders*, p. 329) in the same situation as the two former species. A close examination of the palpi and palpal organs of the males, and of the sexual appendages of the females, would be necessary, for anyone not well acquainted with them, to separate individuals of the three species.

O. P.-CAMBRIDGE.

January 9, 1867.

Life-history of Satyrus Aegeria.—The eggs are laid singly on the stalks or leaves of several species of grass, in July, and are almost spherical in figure, the entire surface being reticulated with minute ridges, which divide it into hexagonal cells, and give it the appearance of being honeycombed: the young larvæ emerge in eight or ten days, and feed on the leaves of grasses: at first they are of a dingy brown colour, except the head, which is black, and exhibit but little indication of stripes; after the first moult they lose their black heads and assume green ones. Sepp observed them to moult “five times, namely, on the 11th of August, when eight days’ old, on the 18th and 27th of the same month, and on the 4th and 15th of September, and that they ate their skins after each moult.” They are full-fed by the end of September, when they rest in a perfectly straight position on a blade of grass. Head subglobose, wider than the 2nd segment, scabrous, the raised points causing the scabrosity emitting small but rigid bristles: body slightly shuttle-shaped, the attenuation being more manifest towards the anal extremity; incisions of the segments deeply and conspicuously marked;

the segments are again transversely wrinkled or divided into narrow sections; the entire surface is slightly scabrous, and covered with very minute but stiff bristles; the anal extremities produced into two parallel points directed backwards. Colour of the head and body either dull olive-green or dull pale umber-brown; in either case the body has three compound or triple stripes; one of these is dorsal, and is composed of a medio-dorsal dark smoke-coloured stripe, and two yellowish or whitish marginal stripes, the dark medio-dorsal stripe being in some specimens again divided by a very narrow and indistinct white stripe; this median compound stripe terminates with the 12th segment; the other compound stripes are lateral, composed of the same colours, and terminating in the anal points. Early in October the larva spins a slight silken covering on a stalk, stem or blade of grass, and, suspending itself therefrom by the anal claspers, is changed to an obese pupa, with the head broadly emarginate, the thorax, wing-cases and abdomen gibbose, and suspended in an oblique position by anal cremastæ: the skin of the larva always remains attached to the anal extremity, even after the butterfly has escaped: colour of the pupa dingy green or brown, the antenna-cases barred, the wing-cases streaked with dark brown or black; the back is also freckled with black, and has four or six white dots. In this state it remains throughout the winter, the butterfly appearing on the wing from the 10th to the 20th of the following April. The opinion appears universally to prevail that this species is double-brooded, and in this (reasoning from analogy) I feel inclined to concur, although I have never seen an æstival brood of larvæ, nor is such mentioned by Sepp, whom I believe to be the only entomologist who has previously written a life-history of the species. I am indebted to Mr. Buckler for the loan of a beautiful and most life-like drawing of the larva.—*Edward Newman.*

Life-history of Satyrus Tithonus.—The eggs are laid during July on the blades of grass, and may be described as truncated cones; they stand erect, the base being broader than the apex, and serving as a very secure attachment to the young grass; they have sixteen, seventeen or eighteen perpendicular ribs, and a great number of extremely delicate transverse striæ, only visible under a lens of high power;

their colour at first is canary-yellow, but in a few days they acquire a browner hue, and before the emergence of the larva they exhibit a darker band. The young larvæ emerge during August, generally between the 5th and 25th, and at first eat very little and grow very slowly; they moult twice before the winter, and hybernate at the roots of grasses while still very small; in May they reascend the grass and feed voraciously, and are full grown by midsummer. The larva, when full-grown, rests in a perfectly straight position on a blade or stalk of the food-plant, which is *Triticum repens*, a favourite food of the genus; but when annoyed it falls to the ground, assuming a crescentic posture. Head sub-globose, exserted, manifestly wider than the 2nd segment, thickly covered with scabrous points, each of which emits a minute bristle: body somewhat shuttle-shaped, the diminution towards the head being rather less than towards the anal extremity; the divisions of the segments are clearly defined, and each segment is transversely wrinkled or divided into sections, which are usually, but not invariably, six in number; each of these sections is beset with scabrous points, and each point emits a short and slender but stiff bristle; the 13th segment terminates in two scabrous conical points parallel to each other and directed backwards. Colour of the head pale pinkish brown; of the body either glaucous-green or olive-green, or, in some specimens, pale dingy brown; in either case it has five nearly equidistant longitudinal stripes; a narrow and dark medio-dorsal stripe extends from behind the head to the sinus between the caudal points; on each side, half-way between this and the spiracles, is a pale stripe, bordered above with a dark ground colour, which makes it appear more conspicuous; and below this, on a line with the spiracles, is a more distinct and whiter stripe; this also is bordered above with a dark ground colour: feet and claspers concolorous with the body. When about to change the larva attaches itself by the anal claspers to a blade of grass, and in two days is transformed into a pupa, suspended by minute anal cremastæ from a delicate silken carpeting, with which the larva had previously and designedly covered a small space on the grass. Pupa short and obese; head dilated, flattened in front, the flattened portion broadly emarginate on the crown, produced on

the sides into obtuse ears, and slightly excavated between them; the thorax has a sharp medio-dorsal keel; the abdomen is dorsally somewhat verrucose, having four longitudinal dorsal series of extremely depressed and scarcely perceptible warts; colour almost white, sometimes slightly tinged with green, and ornamented with numerous black markings, of which the undermentioned are the most conspicuous—a narrow dorsal line on the thorax, divided just behind the head, and again united; two dorsal stripes commencing very near the back of the head, passing on each side of the thoracic dorsal line, then dilating and broken up into subquadrate and rather paler blotches; on each side exterior to these is another somewhat similar marking, commencing on the thorax as a stripe, but interrupted and vague towards the anal extremity; and again, exterior to this is a broad black linear patch adjoining the wing-cases; the wing-cases are dashed with black longitudinally; the cases of the antennæ are most delicately marked with black, each joint having two round black dots; the cases of the middle and hind legs are almost entirely black. The last skin of the larva is not shed, but, being gradually pushed downwards by a wriggling movement of the pupa during its metamorphosis, encompasses the anal segment only, and remains in this position even after the butterfly has made its escape. The butterfly is on the wing during the whole of July: I have never seen the slightest indication of a second brood.—*Edward Newman.*

Life-history of Lycæna bætica.—The last-disclosed females of this species lay their eggs on the twigs of *Colutea arborescens* (bladder senna), but, like those of several, and perhaps all, the British species of *Thecla*, they do not hatch until the following summer, at which season the young pods of the *Colutea* are sufficiently advanced to serve as its food: the young larva is almost black, and at first only destroys the scarcely-formed pods; subsequently it enters the pods through a nearly circular aperture, and devours the seeds; before attaining its full size it migrates frequently from pod to pod, only devouring the seeds in the interior: it rests on the pods or on the twigs in a straight position, its shape scarcely allowing of any other. Head very small, scarcely half so wide as the 2nd segment, into which it is susceptible of being withdrawn, and thus entirely concealed: body

shaped like a woodlouse, the dorsal area convex, the ventral area flat, the incisions of the segments very clearly marked. Colour of the head black: dorsal area of the body olive-green, reddish brown or bright green; there is a dark and moderately wide medio-dorsal stripe, perfectly continuous, from immediately behind the head to the anal extremity, and also a white lateral stripe below the spiracles, which are yellow; immediately above each spiracle, with the exception of the first and last, there originates a rather short line, which passes obliquely forwards and upwards towards the medio-dorsal stripe, but never unites with it; these oblique lines are longitudinally double throughout, the upper part being darker and the lower paler than the ground colour; the claspers are concolorous with the ventral area; the legs brown. When full-fed this larva never remains within the bladder on the seeds of which it has fed, but (generally in the month of September) it escapes from the pod which had last served as its dwelling-place, and either descends among the dried leaves or attaches itself to a branch of the shrub, and in five or six days assumes the pupa state. The pupa is attached by a girth round the middle to the stem of the *Colutea*; it is obese, and rounded at both extremities; its colour testaceous yellow or dull red, adorned with brown dots, which are particularly numerous about the crown of the head; there is also a continuous dark line in front, extending from the thorax to the anal segment; the spiracles are black and plainly discernible with the naked eye. It remains in the pupa state a fortnight, the butterfly appearing on the wing about the middle of September, and continuing to fly throughout October. The larva is infested by a minute *Ichneumon* (*Microgaster glomeratus*), fourteen or fifteen of which frequently feed on a single larva, and these, escaping through the skin of the butterfly larva, spin a cluster of little yellow cocoons, attaching them to the stalks or leaves of the food-plant. *Lycæna bætica* having twice occurred on our coast near Brighton, and having thus established its claim to be considered British, I have extracted the foregoing particulars from M. Millière's beautiful work, kindly lent me by Mr. Doubleday, from whom I obtain the additional information that the larva is also found feeding in the pods of the field pea.—*Edward Newman.*

Description of the Larva of Phibalapteryx vitalbata.—The eggs are laid during the summer months, July and August, on Clematis vitalba (common honesty, or traveller's joy), and the larva feeds, as far as my observations extend, exclusively on this plant. The larva appears to be full-fed in October, and then rests in a very rigid, straight and stick-like position, attached by its claspers, and sometimes also by its feet, often thus forming a bridge between two leaves or two petioles. Head equal in width to the 2nd segment, flat, generally porrected on the same plane as the body, but when the larva is annoyed, bent down into a prone position; the antennal papillæ are very conspicuous and slightly divergent: body cylindrical, but having a lateral skinfold, and being wrinkled transversely, the wrinkles being more manifest towards either extremity: the head and body have many small scattered warts, and each wart emits a rather stiff bristle. Colour of the head gray, with a median brown stripe, which dilates at the mouth, where it terminates in two black spots: the gray cheeks are adorned with a double series of short narrow black lines: body grayish umber-brown, paler and almost pure gray towards the anal extremity; there is a medio-dorsal, narrow, and almost black stripe extending from the head, where it meets the dark median stripe of the head, to the anal flap; this is interrupted at the interstices of the segments, and indistinct in the middle of the body, but strongly pronounced at both extremities; skinfold pale, the pale colour much interrupted and broken into spots, but extending on each side into the anal claspers, where it is very conspicuous, and bordered on each side with dark brown approaching to black: ventral area dark brown, with a medio-ventral dark stripe, intersected throughout by a narrow light stripe, which is sometimes entire, sometimes broken into shuttle-shaped divisions: legs and ventral claspers concolorous with the body. I am indebted to Mr. Moncreaff for a supply of this larva, which was full-fed at the end of October.—*Edward Newman.*

Description of the Larva of Epunda viminalis.—The eggs are laid in August, but are not hatched until the spring: the plants usually selected by the female are two species of Salix, *S. capræa* and *S. cinerea*, both familiarly known by the name of willow; on both these species the larvæ feed, previously

spinning together the edges of some of the leaves, and constructing a kind of imperfect tent, in which they are concealed from birds. The larva is full-grown at the beginning of June; it then rests in a tolerably straight position, and if disturbed falls from its food-plant, curled up into a very lax and imperfect ring, and remains motionless for many minutes. Head rather small, decidedly narrower than the body, prorected in crawling: body smooth and velvety, almost uniformly cylindrical, but evidently attenuated towards both extremities, and having the ventral flatter than the dorsal surface. Colour of the head almost white, having an extremely slight tint of green, and being finely reticulated on the cheeks with a darker colour; it also has black mandibles, a straight black transverse line just above the mandibles and labrum, and a black margin where received into the 2nd segment; this black margin is only observable when the larva is crawling. Body pale glaucous-green, with five still paler but scarcely white equidistant dorsal stripes; the broadest of these is medio-dorsal, and, together with the next on each side, extends from the head to the extremity of the anal flap; the exterior stripe on each side passes just below the spiracles, touching all of them, except the 9th; the spiracles are perfectly white, encircled with a black ring; between the medio-dorsal and the next stripe is a series of about thirty small circular spots, or rather dots, of exactly the same colour; there are three on each segment, the middle one being nearest the medio-dorsal stripe; each has a minute black dot in the centre, and from the black dot emanates a very slender bristle: the ventral surface and claspers are concolorous with the back; the legs paler and almost transparent, and encircling the base of each is a black ring, which emits two spreading branches anteriorly. I am indebted to Mr. Doubleday for a supply of these larvæ, which were full-fed the first week in June, when they spun up in leaves that had fallen on the earth at the bottom of the breeding-cage. The moth occurs amongst the foliage of the oak throughout August and September, and frequently falls into the umbrella when the Entomologist is beating for autumnal larvæ.—
Edward Newman.

Description of the Larva of Herminia grisealis.—The eggs are laid in July on *Quercus Robur* (oak), on the leaves

of which the larva exclusively feeds, concealing itself generally on the under side of the leaf. Head prone, subglobose, slightly notched on the crown, of the same width as the 2nd segment: body obese, velvety, rather attenuated towards both extremities, having the incisions of the segments strongly marked and the dorsal area transversely wrinkled; the anal claspers are slightly divergent, and the entire surface of the body has here and there a feeble bristle or hair. Colour of the head and body dingy sienna-brown, with a very narrow medio-dorsal black stripe, in close proximity with which is a black dot on each side of each segment, and a second black dot behind this and rather more distant; the spiracles are also black, and the entire dorsal and lateral areas are delicately reticulated with black; the legs, claspers, and ventral area are somewhat paler than the dorsal area, and entirely without markings: this larva is full-fed in October, and, spinning a slight web, hybernates while yet unchanged; the pupa state is assumed in the spring, and the moth appears on the wing in June. I am indebted to Mr. Machin for a pair of the full-fed larvæ of this species, and the information respecting its habits.—*Edward Newman.*

Description of the Larva of Pionea margaritalis.—The eggs are laid amongst the flowers of *Sinapis alba* (white mustard), and, according to my kind correspondent, Mr. Brown, of Cambridge, also on *Sinapis arvensis* (charlock), in July: the young larvæ emerge from the 1st to the 11th of August, and, as soon as hatched, commence spinning a web or tent, under which they conceal themselves by day, three or four under one tent; but come abroad by night, and feed on the seed-pods, first gnawing a hole in the pod just above the seed: they are full-fed at the end of August, but still remain in their tents by day; when disturbed they fall out and hang by a thread, but never roll in a ring. Head narrower than the 2nd segment, into which it can be partially received, slightly notched on the crown, and very glabrous: body attenuated towards the anal extremity, each segment dorsally divided into two sections by a transverse fold: body slightly warty, each wart emitting a bristle. Colour of the head black and very glabrous, the labrum and antennal papillæ white; a narrow ring round the neck and the medio-dorsal surface of the 2nd segment pure white: colour of the

rest of the body yellow and purple, both colours rather dingy; these colours are disposed in five broad longitudinal stripes; dorsal stripe yellow, intersected by a narrow median stripe of a brighter colour, approaching to orange: the dorsal stripe is without warts; it is bounded on each side by a broad purple stripe, which contains three black warts on each segment, except the 2nd, and on this is a black, corneous, glabrous plate; below this stripe on each side is a yellow stripe containing the black spiracles; ventral surface smoky flesh-colour, with a series of black warts above the claspers; legs and claspers concolorous with the ventral surface. When full-grown these larvæ leave their tents, and, descending to the ground, construct a tough cocoon, composed of particles of earth united together by silken threads; within this retreat or hybernaculum they live unchanged, but without feeding, throughout the winter, and until the beginning of May, when they change to pupæ: the moth appears at the end of June and throughout July, frequenting the flowers of the food-plants, and particularly when growing amongst standing corn. I am indebted to Mr. Thomas Brown, of Cambridge, for the opportunity of describing these larvæ.—*Edward Newman.*

Life-history of Yponomeuta padella.—The eggs are laid in June and July, principally on the inner and lower branches of apple trees in orchards and gardens: the young larvæ emerge the following May; they are then small, dirty, grub-like creatures, and some get on to the young leaves and there cover themselves with a web, in which they grow rapidly: when full-fed the body is of an ashy gray colour and semi-transparent, with a darker patch on each segment below the dorsal line; the head and corslet are dark; the entire surface of the larva is slightly hairy, and it measures six or seven lines in length. When about to make up, these larvæ, often in small but sometimes in large companies, spin long white silken cocoons, which are arranged side by side: the moth makes its appearance in about eighteen days, in June and July. This pest generally attacks only the leaves of the apple trees, but is no less injurious on that account: they are strictly gregarious, living under a web through the whole of May and the beginning of June: they are continually enlarging the web and enclosing more leaves, which they devour under its shelter, and so proceed until a whole orchard is

enveloped in web and entirely stripped of its foliage. Mr. Hodgkinson and I examined a large orchard last June, at Wetherslack, in Westmoreland, and failed to find a single leaf.—*C. S. Gregson.*

Entomological Notes and Captures.

Butterflies at Sea.—On the 16th of September last the ship 'Whinfell' was overtaken by a cyclone at a distance of about six hundred miles from Cambia, on the coast of Africa, and two hundred miles from the Cape de Verde Islands, the nearest land; we went twice round the compass during the storm. A great many birds and butterflies came on board; among the former two species of owls and one of the heron family, besides a number of small birds: some of them lived three or four days. The butterflies were very numerous.—*William Henry Herbert, late of Colombo, Ceylon, in a letter to Mr. Peter Gray, of 13, Mark Lane, London.*

[Mr. Gray requests me to name the butterflies: they are of two species—*Diadema Bolina* of Boisduval, a native of India, Java, Borneo, Formosa, Natal, Sierra Leone and Jamaica; the black specimens with whitish blotches are females, the brown specimens are males: the other species is *Pyrameis Cardui*, which seems absolutely cosmopolitan.—*Edward Newman.*]

Bombyx Rubi, &c., do breed in Confinement.—I am happy to be able to answer Mr. M'Dowall's query (*Entom.* iii. 203) with regard to *Bombyx Rubi* pairing in confinement. I took full-fed larvæ on the 30th of March, 1866; they began to spin on the 8th of April, and a pair came out on the 9th of May: they paired readily from eggs laid on the 14th of May, and hatched on the 25th. I have some larvæ, nearly full-fed, hibernating. *Saturnia Carpini* also paired, but as I gave away the eggs I am unable to say how they turned out. *Arctia fuliginosa* and *Orgyia fascelina* also bred very freely.—*J. Watson, jun., Bensham, January 11, 1867.*

Scarcity of Macroglossa Stellatarum.—I should like to know if many captures of this insect have been made this year, presuming such is not the case by the non-appearance of records in the '*Entomologist.*' I see also (*Ent.* iii. 189)

that I am not the only one who is wondering at their disappearance, and desire to know the reason. Three only have been seen about here to my knowledge, *i. e.*, one that I caught (but lost while bringing it in-doors) on June 20th, on Sweet-william, which I looked upon with joy as the believed forerunner of many more; one also at, and another near, Langley, Maidstone, Kent. — *David J. French; Chatham, December 14, 1866.*

Acidalia mancuniata and *A. veterata*. — I am so pressed to give an opinion on the insects for which these names have been proposed that I feel bound to say a few words. I have already (Entom. iii. 161) cited Guenée, who expresses a belief that several species may be included under the Haworthian species, subsericeata; but I did not mention that Zeller had described two of these, and Rössler a third, long before our English entomologists had turned their attention to the subject, and that Herrich-Schæffer had figured two of these supposed species. Instead, however, of going anew into the bibliography of the question, it will be amply sufficient to make the following extract from Staudinger's Catalogue:—

“No. 53. Subsericeata, *Haworth*, p. 352 (1810); *Guenée*, i. 495.

“No. 54. Pinguedinata, *Zeller*, *Isis* (1847), p. 521; *Herrich-Schæffer*, 409, 410; *Guenée*, i. 481 (præc. var.?)

“a. var. *Asbestaria*, *Zeller*, *Stettin, E. Zeitung* (1849), p. 216; *Herrich-Schæffer*, vi. p. 66.

“b. var. *Oloraria*, *Rössler*, *Jahrb. L. ver. f. Naturk. Nassau*, heft xii.”

Both the Lancashire insects are without question the *Acidalia pinguedinata* of Zeller, *mancuniata* being females, *veterata* males: if therefore any name be used to designate the supposed species, it must be *pinguedinata* of Zeller; but after the fullest investigation I am able to give the subject, I am unable to find any character of larva, life-history, or imago by which either of the new species can be separated from *Acidalia subsericeata* of Haworth.—*Edward Newman.*

Aylina Zinckenii near *Guildford*.—No sooner do we hear of a specimen of this novelty occurring at New Cross than a second has been taken at Guildford: it was sent up unnamed to Mr. Cooke, of Oxford Street.—*Id.*

Ellopia prasinaria at *Eltham*.—On the 15th of June, 1861, my brother captured, at rest, on palings in this neighbourhood, a beautiful specimen of the variety (?) of *Ellopia fasciaria*, *prasinaria*.—*Albert H. Jones; Eltham, December 8, 1866.*

Glæa erythrocephala near *Canterbury*.—This insect has very unexpectedly turned up near Canterbury. I hear that a Mr. Parry has taken five specimens, and several others have been incidentally mentioned.—*Edward Newman.*

Proceedings of the Entomological Society of London.

December 3, 1866.—Sir John Lubbock, Bart., President, in the chair.

Mr. Higgins, of 24, Bloomsbury Street, and Mr. Swanzy, of 122, Cannon Street, were elected Members; Mr. Schrader, of Shanghai, a Foreign Member; and Mr. F. Lovell Keays, of 4, Harringay Villas, and Mr. Thornborrow, of 4, Provost Road, Annual Subscribers.

Mr. Stainton exhibited living specimens of *Gracilaria scariella*, bred from larvæ mining in the leaves of *Echium vulgare* at Cannes, which he had received a fortnight ago from M. Millière; also a flat pouch-like gall formed on the leaves of *Pistacia lentiscus*, apparently by Aphides, but which was inhabited by a Phycideous larva: this he had received from Mr. J. T. Moggridge, who met with it at Mentone.

Mr. Janson exhibited a collection of insects, chiefly Coleoptera, made by Mr. W. Hume in the neighbourhood of Rio de Janeiro.

Mr. Evans sent for exhibition a number of insects found in wool imported from New Zealand, accompanied by the following note:—

“Some time ago I brought under the notice of the Society the circumstance of the large number of *Pyronota festiva* found in wool imported from New Zealand. Since then I have requested my friend to continue sending me every insect which might be found in the fleeces from that locality, and now beg to exhibit the various insects, larvæ, animals, a seed, a shell, &c; &c., which have been thus found. The

Pyronota seems to be in the greatest profusion, and the specimens vary very much in colour."

Mr. Duer exhibited a pupa of *Vanessa* having some extraordinary projections from both wing-cases.

Dr. Sharp exhibited specimens of *Stenus major*, *Mulsant*, taken at Southend: this insect was new to our Fauna, and was hitherto known only as a native of the South of France.

Mr. Westwood read the following letter from Mr. E. W. H. Holdsworth, dated Shanghai, July 20, 1866:—

"I trust you will pardon my taking this liberty, but my excuse is this,—reading your revised edition of Drury's 'Exotic Entomology,' the other day, I noticed you remarked that no authenticated description of *Actias Luna* had been sent to you: as I have reared several specimens this summer I am able to give you a correct description of this larva. As soon as hatched the worm is reddish brown, with two black bands round its body and several black spots: after the first change it is reddish brown, with fleshy points all over its sides and back, each point surmounted with a black spot and one thin white hair. In two or three days the larva changes to a yellowish red colour, a sign that it is about to pass to its second skin: after this change it appears of a light yellowish green colour, the fleshy points (mentioned before) are yellow, and each is surmounted with one brownish hair. On the head are four large fleshy points, which are each surrounded by a black ring, below the extreme tip, which is yellow. After the next change the four major spots on the head and the one at the end of the back are very large, and have seven short hairs or bristles sticking out at the ends. This is the last change, and the larva is now about two and a half or three inches in length, and fully one inch in diameter. It is fairly common in the neighbourhood of Shanghai, and always found feeding on privet. Those I reared I fed with willow, and they thrived very well on it. It spins a very large cocoon, fully two and a half inches long, but with too much gum about it to allow the silk to be made use of. The caterpillar has down its back two straight lines or ridges of fleshy lumps, which terminate with a single lump placed over the joint of the last leg and in the centre of the back: along each side and just above the legs is a yellowish line, running the length of the body and terminating at the fleshy lump

placed on the side of the last leg. The vent and outsides of the two last legs (right and left) are of a very deep plum-colour. In this change the black rings on the four major fleshy lumps on the head almost fade away, and the caterpillar is well covered all over with thin hairs about one-eighth of an inch long: at the base of each leg is a yellow spot, and over the mouth are four spots or fleshy lumps forming a crescent. Now comes the fourth change, and the larva is now about two inches long; the fleshy lumps on the back and sides have changed to reddish yellow, with a black ring on the top of each lump and four black short hairs also: on each side of the light-coloured line on the side of the larva are little reddish yellow spots, and on the line at the base of each leg are diamond-shaped marks, the inside yellow and the outer mark dark red: the legs and under part of the body are or a beautiful dark green, the sides a lighter green, and the back much lighter still and covered with white hairs; the legs are covered with black hair, and all the fleshy lumps with four or five black bristles. There can be no mistake about the larva I have described, for those I have reared have now come out of their cocoons, and the moth is a white-green, with one spot on each wing, two under wings swallow-tailed; a pink or rather reddish pink line borders the top of the upper wings and crosses the head; the body covered with white down."

Mr. Westwood added that Mr. Holdsworth had mistaken the Asiatic *Actias Selene* for the North American *A. Luna*: the larva of the Indian species was figured in the fifth volume of the Society's 'Transactions,' from a drawing by Captain Hutton: it was desirable to see the perfect insect, as there appeared to be several local races of it.

Mr. Westwood exhibited a series of specimens of *Liparis dispar*, reared from the egg-state by Mr. Briggs, of St. John's College, Oxford, illustrating not only a remarkable variation, according to the nature of the food of the larvæ, but also showing a strong tendency to degeneration. The progenitors of these specimens, two or three generations back, had been obtained wild in Yorkshire, and were of moderate size (not so large, however, as the specimens formerly taken in such quantities at Whittlesea Mere). The eggs were received in October, 1865, and the caterpillars hatched during the first

half of the following May. The caterpillars were divided into two groups, those composing one of which were fed exclusively on elm, and the others exclusively on whitethorn. The caterpillars spun up between the 5th and 18th of July. No perceptible variation was observed in the larvæ, cocoons or pupæ of the two divisions. The males in both divisions began to hatch on the 18th of July, but the females did not appear until half the males were already hatched. Almost all the males in both divisions were fully developed, only two cripples appearing out of the thirty-two fed upon elm. The males fed on elm averaged one inch and five-twelfths in the expansion of their fore wings: they were uniformly coloured, much darker and richer than the males fed on the whitethorn, the dark markings on the fore wings were strongly defined, the ground colour of these wings was also darker; the hind wings were reddish brown. The males fed on the hawthorn were considerably smaller, averaging only one inch and two-twelfths in expanse; the ground colour of all their wings was paler and grayer than in the others, but the markings of the fore wings were generally well-defined. A few of the males in each division were considerably smaller than the specimens exhibited. In the elm-fed females fourteen out of sixteen were crippled, with their wings not properly developed, and even the other two were slightly crippled: they were not so large as those of the hawthorn-fed larvæ. Having been impregnated by the males, none of these females deposited eggs, although they pulled off the down from their tails and fixed it in tufts in the box, after the manner adopted by ordinary females of this species in the act of oviposition. Of the whitethorn-fed females less than one-half were crippled, and these were not generally so much crippled as the elm-fed females. This experiment seemed to prove that had the species depended solely on the existence of the elm-fed individuals it would have become extinct; whilst the smaller size of the males of the hawthorn-fed group showed that even amongst them (the females of which were so much better developed than the elm-fed ones) the principle of degeneration had set in, and that it would have been very improbable that a distinct phytophagic race or sub-species would have been effectually produced. [Specimens similar to those exhibited by Mr. Westwood have been reared by thousands in London

from French stock. The species has only occurred, in a natural state, in one locality in Britain, Yaxley Fen.]

Mr. Bates, having referred to a discussion which had taken place at a previous Meeting respecting mimetic resemblances, introduced Mr. T. Belt. As to the aversion of insectivorous birds to the Heliconiidae, Mr. Belt gave a detailed narrative of his observations on this subject, and stated that not only were the perfect insects of *Heliconia* protected by their unpleasant odour, but that the larvæ also were rejected by fowls.

Mr. Stainton remarked that a curious instance of the dislike which birds seemed to have for certain insects had come under his observation some years previously. When he was attracting moths by light, he had often such numerous attendances that he had frequently captured fifty Noctuæ, or more, in a quarter of an hour; whatever came must be caught, or it was in the way; and, in order to ascertain most readily whether there was anything of value, Mr. Stainton adopted the plan of smothering the whole lot with the fumes of sulphur. When the operation had been performed, more than nine-tenths of the dead insects would probably be *Agrotis exclamationis*. He thus had a vast store of useless dead moths, which he disposed of by giving them to the poultry, the young turkeys particularly enjoying them in spite of their flavour of sulphur. On one occasion, amongst a number of *A. exclamationis*, there was one specimen of *Spilosoma Menthastri*, and though not one of the young turkeys rejected a single *A. exclamationis*, they each in succession took up the *S. Menthastri* and put it down again, and it was left, conspicuous as it was, on the ground. This insect, it was well known, had a peculiarly disagreeable odour.

Mr. Weir had frequently noticed that caged birds refused the larvæ both of *Spilosoma Menthastri* and *S. lubricipeda*.

Mr. Westwood said that a fluid of a very disagreeable odour was emitted by those insects from behind the collar; this was probably similar to that ejected by many of the Chrysomelidae. He inquired whether anything of the kind had been observed in the Heliconiidae.

Mr. Bates said that one group of Heliconiidae was furnished at the apex of the abdomen with a process from which,

when the abdomen was pressed, a very disagreeable odour was exhaled; but he had never seen any fluid ejected.

Dr. Sharp read the following propositions, in contravention of the theory of mimetic resemblances advanced and so ingeniously advocated by Messrs. Wallace and Bates:—

1st. That natural selection was a power of differentiation, and, although it was quite possible that a differentiating power might work so as to produce resemblances, it was at first sight improbable that it should do so; and more evidence was required of the truth of a paradox than of a truism.

2nd. It must be shown that animals possessing the so-called mimetic resemblances occurred far more frequently in company with one another than away from one another. But if this were shown, a single case of such resemblance between animals living in different localities would throw doubt on the theory, by suggesting that there was probably some more comprehensive law which would account for *all* those resemblances.

3rd. It must be shown that the cause of the rarity of the *Leptalis* was one acting on the insect entirely or chiefly while it was in the perfect state: this had not been done, and it was improbable that it could be; for the most critical periods in the life of *Lepidoptera*, as regarded their enemies, were the larval and pupal states.

4th. It must be shown that the enemy (whatever it might be) which attacked the *Leptalis* sought its prey principally by the sense of sight; but this suggested another improbability. If the *Heliconia*, which the *Leptalis* resembled, was protected by its nasty odour, surely the bird or other enemy of the *Leptalis* must be very foolish to let *it* escape when it smelt nice, because it *looked* like the *Heliconia*. The purpose of protection would have been better accomplished by the *Leptalis* mimicking the *Heliconia* in that point by which the *Heliconia* was protected.

5th. A forcible objection to the mimicry theory (as already pointed out by Mr. Westwood) was the rarity of the mimicking species. The theory involved the hypothesis that there was a time when the *Leptalis* differed in pattern from the *Heliconia*; was the *Heliconia* then commoner than now, or as rare? If commoner, it was curious that, when not protected,

it flourished better than now, when protected. If as rare, how could it have survived at all before and during its transmutation? It would, perhaps, be suggested that the *Leptalis* was formerly commoner than now, and that some enemy arose, rendering it necessary that the *Leptalis* should find a new means of defence. This, however, was mere supposition, and it was almost impossible to adduce facts to prove it; but supposing it to be the case, why did not the enemy exterminate the *Leptalis* when it did not resemble the *Heliconia*, as (according to the theory) it would now, but for this resemblance. The further supposition must be made, that the enemy was not at first very dangerous to the *Leptalis*, and that in proportion as it grew dangerous the *Leptalis* grew more and more to resemble the *Heliconia*: it was certainly very fortunate for the *Leptalis* that spontaneous variations, bringing it to resemble the *Heliconia*, should occur in the exact proportion required for its safety.

6th. Again, taking the time when the *Leptalis* differed in pattern from the *Heliconia*, it was said that specimens exhibiting small variations approximating to the *Heliconia* were selected for the preservation of the species. But a small variation in marking would be of no practical service to the *Leptalis*, especially as it was by its nasty *odour* that the *Heliconia* was protected; to which it might be added that on the theory of Natural Selection no reason or fact was brought forward to induce the belief that variations of the required sort should occur at all.

In conclusion, Dr. Sharp expressed a very decided opinion that the evidence as yet adduced was insufficient to convince an unprejudiced observer of the truth of the theory of mimetic resemblances. The theory was very ingenious, and might or might not be true.

Mr. Wallace replied at great length, reviewing Dr. Sharp's six propositions with great care and fairness, but adducing no arguments differing from those with which Entomologists are already familiar as employed by the advocates of the theory.

Mr. Westwood then reiterated the opinions he has previously expressed, and the President closed the discussion.

THE ENTOMOLOGIST.

No. 39.]

MARCH, MDCCCLXVII.

[PRICE 6D.

Irish Insect-Hunting Grounds. By EDWIN BIRCHALL, Esq.

II. GALWAY.

From Dublin to Galway the rail lies across the central limestone plain of Ireland: although the formation known as mountain limestone, it presents none of those long lines of hills and scars which characterize it in England, and from which it derives its name; and until, at Athlone, very nearly in the geographical centre of Ireland, the Shannon is reached, there is little to be seen but dead levels of pasture and bog.

The Shannon at Athlone, 130 miles from the sea, is almost as wide as the Thames at London, but there the resemblance ends; a solitary turf-boat is probably the only moving thing on the surface of the great Irish river, and its banks are overlooked not by gigantic warehouses, but by long lines of fortification, bristling with cannon and manned by an English garrison. The contrast with busy England jars painfully at first; there is a feeling of regret at seeing such great natural sources of wealth neglected, and the noble river allowed to flow past without paying toll in the shape of work; but I am not sure that reflection quite confirms these ideas. Are we right to consider a river as only so much water-power, or what is called "a highway for commerce?" Stand on the bridge at Galway, under which the stream from Loch Corrib rushes, and you may see the salmon lying motionless in the depths far below. Repeat the process on the bridge at Leeds or Manchester: dead dogs and cats are what you will probably see, and those only the floating ones, for the inky stream conceals the nameless horrors of its bed. Will any number of dye-houses or tan-yards balance the account? Would Ireland or the human race be any better or happier if Athlone were another Manchester, and Galway a second Liverpool? their streets swarming with savage, squalid, heathen "hands," forced into existence by the power of

steam, the poor bogtrotter no longer basking in the sun, but condemned to the coal-pit, its gloomy daily life and awful final catastrophes? I believe that the absence of coal in Ireland, and the general inaptitude of the people for regular and monotonous labour, and not legislative wrongs, are the real reasons why England has been able to distance her in the race for wealth and power; but I also believe that the Irishman is not without compensation in his poverty: his labour, if not well paid, is at least healthful, and performed under the blessed sunshine, not in a crowded factory or pestilential mine; God has given him a cheerful temperament, and he has his ancient faith, a faith which to him is no mere belief, but a reality, and which influences his daily life and thoughts to a degree it would be well for Protestant England, with, as she thinks, her purer creed, to estimate at its true value. Excuse this digression, Mr. Editor, and I promise to be more entomological on the other side of the Shannon.

The western portion of Galway, known as Connemara, I have only visited in search of the picturesque. Nearly the whole district, which is larger than many English counties, is in a state of nature, and, I doubt not, will some day produce a rich harvest of novelties to Science. I know of no equally promising hunting-ground in the British Islands, but the extreme humidity of the climate is a drawback to its comfortable exploration.

The localities in which *Zygæna nubigena* occurs are the barren terraces of limestone which form the surface of wide districts in South-western Galway and Clare. Trees and even bushes are absent, and the vegetation is merely what springs from the cracks and fissures of the rocky pavement; yet, strange to say, these stony plains are everywhere divided into sections by carefully-built walls, the stones composing which are frequently of enormous size, and must have required great labour to pile up: they are the memorials of a time which has passed away, when a very numerous population existed here, and the land was divided and subdivided until life could not be sustained on the small holdings. Wholesale emigration to America has depopulated this part of the country; and although a return of the old state of things is not to be desired, there is something very melancholy in coming on the ruined homes of this extinct people.

Not only single ruined cottages may be observed, but whole villages without an inhabitant. The solitude and the appearance of sudden desertion remind one of the descriptions of the deserted cities of Central America; but the miserable roofless hovels, the rotting timbers, the hearthstones covered with a rank growth of nettles, do not tempt the pencil like the great Aztec ruins, and tell of sorrow too near to us in time to be pleasant objects of contemplation.

In this stony wilderness *Z. nubigena* appears at the end of June in amazing numbers; when at its height the air seems alive with red bees; every flower and almost every stem of grass has its occupant, and dozens are on every patch of thyme. Owing to the cocoon being concealed either at or under the surface of the ground, often attached to a stone, but never elevated on the stem of a plant like the cocoons of the other British *Zygænas*, it is very difficult to collect *nubigena* until it actually emerges from the pupa, and hitherto all attempts to rear the larva from the egg have failed.

In some parts of the district ferns are the principal vegetation, and the Englishman, who perhaps cherishes a little plant of maidenhair (*Adiantum Capillus-Veneris*) under a glass in his distant home, is amazed and delighted beyond expression to see what he deemed a rare and delicate plant waving its fronds in rank luxuriance from every cleft and crevice exposed to the sweep of the Atlantic storms. *Asplenium marinum* and *A. Ceterach* are also very abundant.

For Lepidoptera, Sir Thos. Redington's park, near Claring Bridge, twelve miles from Galway, is one of the most productive places I have ever met with: it is of great extent, and contains much uncultivated ground and fine timber. Nowhere else have I had such unfailing success at sugar. All the following insects occur in the Park, besides multitudes of commoner species:—*Leucophasia Sinapis* (very abundant in June; no autumnal brood apparently), *Thecla Betulæ* (larva on the stunted sloe-bushes in June, and the butterfly in August, on the flowers of the bramble, in great profusion), *Polyommatus Alsus*, *Chærocampa Porcellus*, *Zygæna Minos* (typical form), *Setina irrorella*, *Calligenia miniata*, *Ellopiæ fasciaria*, *Geometra papilionaria*, *Asthena sylvata*, *Scodionæ Belgiaria*, *Aspilates gilvaria*, *Larentia Salicata*, *Emmelesia*

blandiata, *Eupithecia subumbrata*, *E. constrictata*, *E. pygmæata*, *Melanthia albicillata*, *Melanippe hastata*, *M. tristata*, *Acronycta Aceris*, *A. Ligustri*, *Nonagria despecta*, *Xylophasia sublustris*, *Apamea gemina*, *Miana expolita*, *Triphæna subsequa*, *Noctua ditrapezium*, *N. neglecta*, *Epunda lutulenta*, *Aplecta herbida*, *Cucullia Chamomillæ*, *Plusia V-aureum*, *Ennychia octomaculalis*, *Rhodaria sanguinalis*.

The Park is freely open to the collector; at least I have wandered through it for a week together, by day and by night, without meeting a human being or any other obstruction; and so abundant is insect life that unless the collector has very moderate desires he had better have large pockets to hold his captures.

There are no inns in the Minos country. Galway is fifteen or twenty miles distant, and the peasantry, though hospitable to excess, live in very uninviting habitations. I remember hearing a story which may serve to indicate the sort of accommodation the traveller is likely to meet with: the circumstance occurred, the narrator said (with some little confusion of historical personages), when Queen Elizabeth sent the "bloody Crummel" (Cromwell) over into Ireland. A captain and a corporal were quartered on a small farmer, and when shown to their beds the captain, who was to have "the best bed," took possession of Pat's own. "And which is mine?" said the corporal; "I'm to have the second best." "Oh," says Pat, "but that's bad for Morgan!" "Who's Morgan, ye villain!" said the corporal. "Why, the pig, to be sure," replied their host; "he sleeps in the second-best bed."

EDWIN BIRCHALL.

Bradford, Jan. 1, 1866.

Naclia Ancilla a British Insect. By EDWARD NEWMAN.

THE family Syntomides comprises a number of day-flying sun-loving insects, of small or moderate size, and having semidiaphanous wings. Their larvæ are intermediate in structure between those of the Zyganidæ and Nolidæ, and spin up in silken cocoons. Four species, belonging to two genera, are registered as inhabitants of Continental Europe: these are:—

1. *Syntomis Phegea* of Linneus, which occurs in the South of Europe, in a few districts of Germany, in Silesia, Belgium and Pomerania: it is a gregarious species, the larvæ feeding in company on many low plants, and also on *Prunus Padus* (the bird-cherry).

2. *Naclia Ancilla* of Linneus, which inhabits Southern Europe generally, and extends northwards as far as Silesia.

3. *Naclia punctata* of Fabricius, which is found in the South of France and on the Ural mountains, in June and July.

4. *Naclia hyalina* of Frivaldsky, which occurs in Turkey. A geographical race of this species, inhabiting Dalmatia, so closely resembles *N. Ancilla* as scarcely to be distinguished; but Herrich-Schæffer's figures of *N. hyalina* (Suppl. Bombycidæ, fig. 127) appear abundantly distinct from that species.

The genus *Naclia* of Boisduval is closely allied to *Syntomis*, but is separated by some slight differences in the number and disposition of the wing-rays.

Naclia Ancilla, the second species in the preceding list, has the fore wings ochraceous-brown and semihyaline, with three nearly circular white spots on each: two of these are closely approximate, placed transversely, and equidistant from the costa and anal angle, but slightly nearer the hind margin; the third is much smaller, and is equidistant between the upper of the two spots already described and the costa; the hind wings are unspotted, and slightly darker than the fore wings; the antennæ are strictly setaceous and of a dark brown colour; the eyes prominent and intensely black; the crown of the head, collar, shoulders and abdomen rich ochreous-yellow; the last has a medio-dorsal series of six black spots. Expansion of the wings one inch. In general facies and habit it closely resembles a *Lithosia*.

Larva obese, hairy, closely resembling those of the *Lithosiæ*, feeding on lichens and spinning up in the same manner.

Mr. Wildman possesses the only British specimen yet obtained; he took it near the sea-coast of Sussex, and has kindly placed it in my hands for examination: Mr. Doubleday has since verified the name.

EDWARD NEWMAN.

A Revision of the British Species of the Genus Bombus.

By FREDERICK SMITH, Esq.

ELEVEN years ago my Monograph of the Bees of Great Britain was published: during the time that has subsequently elapsed a considerable amount of information has accumulated, particularly in respect of the habits of the species; numerous errors and omissions have been detected in the Monograph itself, and a few new species have been discovered. I am therefore desirous of publishing, in a series of chapters, a concise revision of my former work, more particularly so since a recent work on the 'British Bees' has been published, in which 174 species are enumerated as being the number at present known to inhabit this country, whereas I am acquainted with 211: these circumstances have induced me to bring together, in a series of papers, my present knowledge of this family.

There is no genus of wild bees so generally known, in this country, as that of *Bombus*: it contains the humble bees, known to us even in childhood; the schoolboy is familiar with them, and but too frequently ruthlessly robs them of their stores; the artless rhyme that he lisped in childhood taught him that the bee "gathers honey all the day from every opening flower," and he fails not to avail himself of that knowledge.

The *Bombi* are among the first bees that are tempted forth from their winter hybernaculum, and those that first appear are the females that were reared in the nests of the previous year, and which have just awoke from the state of torpidity in which they have passed the winter months: their hum is one of the most joyous notes that greet us in early spring. Humble bees are to be found almost everywhere: they are seen in every sunny nook, they are on the hills, they are in the valleys; and if we are tempted to wander over trackless moors, far from the haunts of man, these bees are there also.

There are no bees that have a wider geographical range: nineteen species inhabit this country, and nineteen additional ones are found in other parts of Europe; eighteen are known from North America and the regions within the arctic circle; India, China, and the islands of the Eastern Archipelago, have at present furnished twenty species, and many more no

doubt will be discovered in the northern parts of the great continent; but in Australia, New Zealand, and Africa the *Bombi* are not found, if we except two or three European species that have been observed to penetrate the north of the latter country: as yet only five or six species have been discovered in the new world, but the above enumeration will show how widely they are distributed.

Of the species found in this country the majority are generally distributed, but a few are extremely local, being confined either to the mountainous or extreme parts of the north, two species having hitherto been found in Shetland only.

During a series of fine, hot and dry summers these bees multiply in great numbers, whilst a succession of cold and wet seasons reduces them; indeed, so greatly were those species that build their nests on the surface of the ground reduced by the continued rains of the summers of 1859—60, that at this time they have by no means regained their usual maximum of abundance.

Their numbers are also greatly reduced by various enemies, and parasites of their own order: field-mice and weasels are said to devour the contents of their nests; such a circumstance has not, however, fallen under my notice. Of insect-parasites various species of *Diptera* are the most destructive to our native species: some nests are infested by species of *Volucella*, which destroy a considerable portion of the larvæ. A fossorial insect, *Mutilla Europea*, is occasionally found, in the larva state, feeding on the young brood of these bees: *M. Drewsen* reared from a nest of *Bombus Scrimshiranus*, taken near Copenhagen, no less than seventy-six of this *Mutilla*; the parasite is, however, too rare in this country to cause any great diminution of their numbers. *Acari* occasionally render their nests almost untenable by their numbers; they devour the honey and wax. I have also frequently found *Coleoptera* in nests, but not in such numbers as to render it at all probable that they cause any great destruction of the inhabitants; *Anobium panicium*, *Antherophagus nigricornis*, and one or two species of *Brachelytra*, are among the number.

The nests of the *Bombi* are constructed either on the surface or under ground: such is the normal habit of the species,

but numerous departures from their normal habits have been observed. One or two species frequently construct nests under stones, in crevices of rocks, and in other situations adapted to their purpose; others avail themselves of the nests of birds; and I have observed one instance in which *Bombus senilis* had taken possession of the nest of a field-mouse, and I am inclined to believe this to be a not unfrequent occurrence. I have recorded one instance of *Bombus Pratorum* having taken possession of the nest of a robin, built in the porch of the cottage of my friend Dr. Bell at Putney; and *Bombus Muscorum* was observed entering the nest of a wren at Holmbush, near Brighton: the eggs of the wren were embedded among the waxen cells of the bee. A lady of my acquaintance, some years ago, observed *Bombus Muscorum* collecting horsehair in the latticed window of a stable, and, by watching her when conveying a load, discovered the nest, composed entirely of that material. These are a few instances sufficient to show that these bees, like those of other genera, as I shall have occasion to record, sometimes depart widely from the normal habit of their species.

Those species that build on the surface of the ground have received the popular cognomen of moss-builders, a term by no means appropriate, since, of the number of nests that I have examined, not more than one in a dozen has been constructed of that material. As well as my experience enables me to judge, the *Bombus Derhamellus* more frequently selects moss than any other species: this bee very frequently selects some cavity in a hedgerow-bank where moss is growing, and under such circumstances chooses that material; but in Yorkshire, where the species is much more numerous than in the South, its nests are of very frequent occurrence in hay fields, and in such situations they are principally constructed of blades of grass and small leaves of various plants, &c. The nests of *Bombus Sylvorum* are also usually composed of grass and the fibres of plants.

The name carder-bees has also been applied to the surface-builders: they are said to comb or card the moss used in constructing their nests. A very interesting account of their proceedings is given by Réaumur; Kirby has given the same history of them, and Shuckard has repeated the account

in his recent work on the 'British Bees.' A representation of a number of humble bees at work will be found in Réaumur's 'Mémoires.' The account is in substance as follows:—"A worker bee takes a small portion of moss, and with its maxillæ and fore legs proceeds to card and comb it; when the pieces are sufficiently disentangled they are placed under the body by the first pair of legs, the intermediate pair receive them and deliver them to the last, which push them as far as possible beyond the anus. When, by this process, the insect has formed behind it a small mass of moss well carded, either the same or another insect, who takes her turn in the business, pushes it nearer to the nest. Thus small heaps of prepared moss are conveyed to its foot, and in a similar manner they are conveyed to its summit or wherever they are most wanted. A file of four or five insects is occupied at the same time in this employment."

The entrance to the nest is also described as being through a "long gallery or covered way, sometimes a foot or more in length." Although I have on several occasions observed these bees at work, I never detected this co-operative process of building: I watched a nest of *Bombus Sylvorum* last summer, and saw working bees dragging pieces of grass towards the nest, but each bee worked alone; and some years ago I saw a colony of *Bombus senilis* in which three or four working bees were dragging pieces of moss on to the nest, not, as described by Shuckard, in the form of pellets, but simply sprigs of moss, which the bees had apparently just cut off, close to the nest. Neither have I ever been able to detect the covered ways; probably these are only occasionally constructed: all the nests that I have examined had entrances at the basal margin of the nest. Reaumur found nests with "the interior surface or roof cased or sealed with a kind of coarse wax, in order to keep out the wet:" this is a process that none of the nests that I have taken had undergone: I have in wet seasons found nests containing a mass of comb covered with mould, all the grubs having perished, and apparently the entire community had shared the same fate.

FREDERICK SMITH.

(To be continued).

Entomological Notes and Captures.

Varieties, &c.—As this appears to be the fashionable entomological question of the day, I have no hesitation in asking for information upon the following point. Most collectors are familiar with the beautiful lemon-coloured form of *Xanthia cerago*. This is always termed a "variety." But is it so? I do not see how this can be proved, except by rearing it from eggs laid by a female of the ordinary character. This, I believe, has not been done, and I fear it is not likely that it will be. These lemon-coloured specimens are rare. During the last five years I have been in the habit of collecting from 300 to 400 larvæ of *Cerago* and *Silago* indiscriminately, and I find the proportion between the lemon-coloured and the ordinary specimens to be as one to sixty. I shall feel very much obliged to any of your readers who will give me their reasons for considering this pale form as only a variety of the ordinary *Cerago*. Meanwhile I may observe that, if it *be* so, such variation is not due either to locality or food, for, as regards the former, it is found all over the country, and, as regards the latter, it feeds exclusively (with me) on fallows. — (Rev.) *J. Greene; Cubley Rectory, Sudbury, Derby.*

Formica herculanea a British Insect.—I am informed by a friend that specimens of this noble ant have been taken near Rannoch. It is a species by no means uncommon on the Continent of Europe, particularly in pine forests: it seems to be very unsociable in its habits, being found in nearly circular cavities of about an inch or an inch and a half in diameter, which it forms in the decayed stumps of pines that have been cut down; sometimes it is solitary, sometimes two or three individuals are found in one cell, but nothing like a numerous colony of these ants has yet been discovered.—*Edward Newman.*

Elaphidion deflendum.—This homely-looking longicorn has been taken at large at Southend, near Lewisham, by Mr. W. West. It is fully described in a former number of this journal (Entom. i. 6) as a native of North America; but the facility with which longicorns are transported in timber is likely to render many of the boreal species cosmopolitan.—*Id.*

Eubolia mæniata near *York*.—On the 19th of August last I took what I thought to be a good variety of *E. mensurata*, A few weeks ago, upon examining the specimen more closely. I found it answered exactly the description in Stainton's 'Manual' of *E. mæniata*. I took it by beating broom.—*W. Prest, York, in Ent. Mo. Mag., January, 1867.*

[I have been some time in possession of this information, but declined to publish it until Mr. Doubleday had verified the name: has this verification been accorded?—*E. N.*]

Hearing of Decapod Crustacea.—We do not yet thoroughly understand how they [Crustacea] see, smell, or hear; nor are entomologists entirely agreed as to the function or the structure of the antennæ. This interesting subject offers a most promising field for study, and I would particularly call the attention of entomologists to a remarkable memoir by Hensen on the auditory organ in the decapod Crustacea. Hensen has shown that the [supposed] otolithes in the open auditory sacs of shrimps are foreign particles of sand, *introduced into the organ by the animal itself*. He proved this very ingeniously by placing a shrimp in filtered water without any sand, but with crystals of uric acid. Three hours after the animal had moulted he found that the sacs contained many of these crystals. M. Hensen has also shown that each hair in the auditory sac is susceptible of being thrown into vibration by a particular note, which is probably determined by the length and thickness of the hair. It may be experimentally shown that certain sounds throw particular hairs into rapid vibration, while those around them remain perfectly still. — *Sir John Lubbock's Address to the Entomological Society of London, Jan. 28, 1867.*

Hearing of Arachnida.—But to return to spiders and the hairs upon their legs; these vary exceedingly in their form and arrangement, but any minute description of them would, I fear, prove uninteresting, more especially as I should be quite unable to define the particular duty assigned to each kind: there is one exception, however, which I shall endeavour to explain as shortly as possible. Mr. Blackwall says, "Nothing is known with certainty concerning the organs of smell and hearing in spiders." As to the former, I have nothing to say; but I wish to suggest that spiders are capable of distinguishing sounds to some extent by means of

very delicate waving hairs which are found on the upper surfaces of their legs: during life they move at their peculiarly cup-shaped bases with the least motion of the atmosphere, but are immovable after death. It is well known that sound is due to vibrations which are generally conveyed by undulations of the air: now I am perfectly satisfied that if these undulations are of a certain character the hairs I am alluding to upon the spider's leg will move, and I wish you particularly to notice that they are of different lengths, so that some might move whilst others would not, and also that the longest is at the extremity of the leg, and therefore can receive an undulation which might die away higher up. I am quite prepared to admit that this arrangement for the sense of hearing might prove most imperfect for *our* purpose; it might nevertheless suffice for the wants of a spider. These waving hairs are undoubtedly sensitive to undulations of the atmosphere which are imperceptible to us, the least movement of the air putting them in motion, and it may be that very quick vibrations, such as we recognize as sounds easily to be distinguished from each other, are confusion to the spider. This part of our subject wants a few careful experiments, and I may just mention that there is a group of these peculiar hairs on the flea; I have also some indistinct recollection of having seen them upon some other insect. With the legs of a spider, which are most sensitive organs of feeling, if they do not also embrace those of hearing, we complete our notice of the principal parts of the cephalothorax.—*Extract from a Lecture by the late Richard Beck, delivered at the Friends' Institute, London, Feb. 20, 1866.*

Proceedings of the Entomological Society of London.

January 7, 1867.—Sir John Lubbock, Bart., President, in the chair.

Mr. S. A. Davis, of 4, Durham-place West, Holloway, was elected an Annual Subscriber.

Mr. Westwood exhibited a number of butterflies, chiefly Heliconiidae, collected by Dr. Burchell in Central South America.

Mr. M'Lachlan asked the reason why humming-bird hawk-

moths (*Macroglossa Stellatarum*) chased up and down stone walls, banks, or cliffs, but particularly stone walls near the sea; dozens of specimens might frequently be seen so doing, and in positions far removed from any flowers. [A number of interesting instances of this singular habit have been given in the 'Entomologist,' and one by Mr. Guyon in which the insect performed the same feat in a papered room, examining the representations of flowers.] Mr. Smith mentioned that he had had sent to him from the Isle of Wight some clay nests extracted from a wall, which eventually produced hymenopterous insects, but which were said by the sender to be formed by the humming-bird-hawk. It seemed probable that his correspondent had noticed the moths performing in the manner described by Mr. M'Lachlan in the neighbourhood of the nests, and had thence erroneously inferred that the nests were the workmanship of the moths.

Mr. Eaton mentioned that he had, during the past season, found near Lyndhurst a hornet's nest in a sandy bank where no wood was near. The colony was a strong one, and the nest so deeply imbedded in the bank that he had been unable to take it.

Mr. M'Lachlan read the following note from Mr. Doubleday on the subject of *Liparis dispar*, introduced by Mr. Westwood at the previous Meeting:—"I do not know of any locality in Britain where it occurs in a state of nature, and I am strongly of opinion that it has only been found in the fens round Yaxley; when I was there in 1839 the larvæ swarmed on the gale and dwarf sallows. English was there in 1846, and he found the larvæ pretty common, but not so abundant as they were in 1839. Haworth simply says, '*salicetis, rarissime.*' I believe all the specimens which were placed in the old collections were continental, or reared from eggs brought from the Continent, as they were very different from the fen specimens, and just like those found in France; and I think most of those now bred in this country are of continental origin. I once collected a great quantity of the pupæ in Paris, and brought them home to Epping. The following spring I turned out thousands of larvæ, but they did not establish themselves, although I saw plenty of the moths in one field in August. In 1846 I obtained an immense quantity of eggs from moths bred from larvæ brought from

Yaxley. Next spring great numbers of larvæ were turned out on the dwarf willows growing among the gravel-pits in the Forest. A few larvæ were seen the following year, but not afterwards. It is very strange that a moth which frequents towns and suburban gardens on the Continent should be found in such a very different locality here. In France the larvæ appeared to feed principally on the elm."

Captain Hutton, of Mussooree, communicated a "Note on the Japan Silkworm," in which he expressed his opinion that *Bombyx Yamamai* is a hybrid between a degenerate race of *B. Mori* and *B. sinensis*, and repeated his conviction that, for the purpose of renewing the European stock, experienced entomologists should visit different parts of China, with a view to the re-discovery of the silkworm in its natural state of freedom.

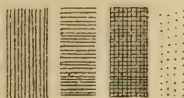
Anniversary Meeting, January 28. — Sir John Lubbock, Bart., President, in the chair.

This being the usual Meeting for the election of officers, a ballot was taken and scrutineers appointed, who declared Sir John Lubbock elected President; Mr. Samuel Stevens, Treasurer; Messrs. Dunning and Sharp, Secretaries; and the following gentlemen Members of Council:—H. W. Bates, J. W. Dunning, Sir John Lubbock, Bart., R. McLachlan, F. Moore, G. S. Saunders, David Sharp, A. F. Sheppard, Frederick Smith, H. T. Stainton, S. Stevens, J. Jenner Weir, J. O. Westwood.

The President delivered a most admirable and eloquent Address on the state, progress, and prospects of Entomology and the Entomological Society, giving a masterly summary of the principal events of the year.

Votes of thanks to the retiring officers were moved, seconded, and carried unanimously. The Meeting was more numerously attended than is usual on these occasions, which are regarded as of rather a formal and routine character.

At Home. — March 1st, 8th and 15th, from 6 to 9 P.M. London Terminus of Peckham Railway at the *extreme* right of London Bridge Station.—*Edward Newman*; 7, *York Grove, Peckham.*



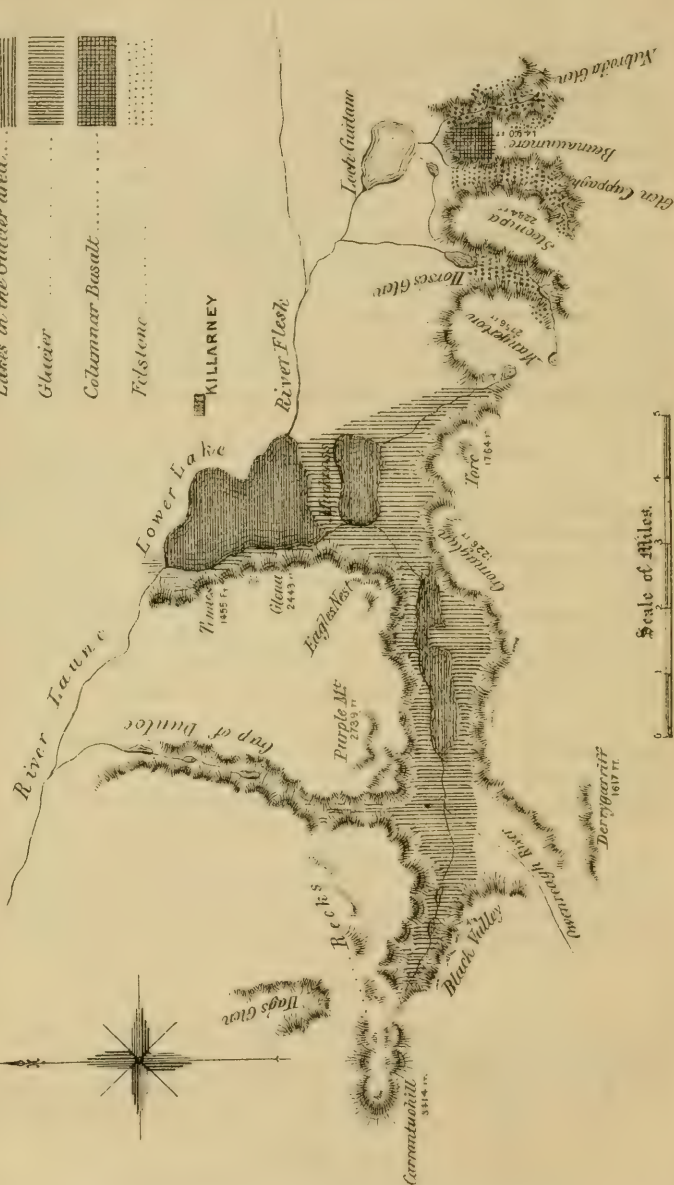
Lakes in the Glacier area.....

Glacier

Columnar Basalt

Folstone

KILLARNEY



Scale of Miles.

THE ENTOMOLOGIST.

No. 40.]

APRIL, MDCCCLXVII.

[PRICE 6D.

Irish Insect-Hunting Grounds. By EDWIN BIRCHALL, Esq.

III. KILLARNEY.

It is not possible in a few words to convey a clear idea of the mountains and lakes which are included in the magic word Killarney, but the general form of the country may be described as consisting of two nearly parallel ranges of mountains of the old red sandstone formation, between which lie the three principal lakes: these communicate with one another, but are divided into separate basins by the spurs of the surrounding mountains.

The mountain of Carruntuohill, one of the range known as the Reeks of Macgillicuddy, closes the western end of the valley, rising sheer from the lake to the height of 3414 feet, the loftiest summit of Ireland; gloomy valleys, surrounded by almost vertical precipices, run deeply into it, sometimes, as in the case of the Gap of Dunloe, cutting completely through; in others, as the Hags Glen from the north and the Black Valley from the south, almost meeting in the heart of the range, the erosive action having apparently ceased just before a great natural cutting was completed through the mountain.

These valleys were probably excavated by the currents of the glacial sea during the gradual elevation of its bed; and it has been clearly shown that the Killarney district, during some part of the glacial period, must have been submerged to a depth of about 2500 feet below its present level:* up to this height the sides of the mountains are rounded, whilst above it they are rough and bristling, the probable result of atmospheric action, supposing the tops to have stood out as islands in the glacial sea.

The great terraces of drift between Tore and Mangerton,

* See explanations to sheet 184 of the 'Geological Survey of Iceland.'

and the huge perched blocks of stone near the Devil's Punch Bowl Lake, 2319 feet above the sea, appear only explicable on the supposition of long and deep submersion; but the grooving and polishing of rock-surfaces, so conspicuous on the low grounds at Killarney, the striæ always being in the direction of the longest axis of the valley, and especially the forms of the islands in the upper lake, with their noses, so to say, all pointing in the same direction as the striæ, seem best explained by the action of land ice moving over the surface of the upraised bed of the glacial sea, and Professor Tyndall takes this view: I extract the following passage from his work, 'Heat Considered as a Mode of Motion:'— "On the south-west coast of Ireland rise the Reeks of Macgillieuddy, which tilt upwards, and catch upon their cold crests the moist winds of the Atlantic; precipitation is copious, and rain at Killarney seems the order of Nature. In this moist region every crag is covered with rich vegetation, but the vapours, which now descend in mild and fertilizing rain, once fell as snow, which formed the material for noble glaciers. The Black Valley was once filled with ice, which planed down the sides of the Purple Mountain as it moved towards the upper lake. The ground occupied by this lake was entirely held by the ancient ice, and every island that now emerges from its surface is a glacial dome. The fantastic names which many of the rocks have received are suggested by the shapes into which they have been sculptured by the mighty moulding-plane which once passed over them. Where the barren rock has been exposed for ages to the action of the weather the finer marks have in most cases disappeared, and the mamillated forms of the rocks are the only evidences; but the removal of the soil which has protected them often discloses rock-surfaces, which are scarred as sharply and polished as clearly as those which are now being scratched and polished by the glaciers of the Alps."

After passing the narrow gorge between the precipices of Cromaghlán and the Eagle's Nest, which form the portals to the basin of the upper lake, the valley expands, and, joined by another glacier descending on the east from Mangerton, the combined mass of ice probably filled, if it did not actually excavate, the basin which contains the middle and lower lakes.

Cromaghlán Mountain (pronounced Cromagloun) is worth a day to itself: the tunnel on the road to the upper lake is the best point from which to commence the ascent: on a shoulder of the mountain, at an elevation of about 1000 feet, is Loch Criumcaun, the only known habitat of *Limnæa involutus*; the shell is found attached to stones and rocks at some depth below the surface of the water, and tasks the collector's patience and ingenuity to secure it uninjured, being so fragile as to break with the slightest pressure. It is closely allied, but in different points of structure, to *Limnæa Burnettii* and *L. glutinosus*: *L. Burnettii* has only been observed in Loch Skene, in Dumfriesshire, and resembles *L. involutus* in having the spire depressed so as to form a concavity; but its shell is larger and stronger, and the mantle of the animal does not envelop the shell entirely, as is the case both in *involutus* and *glutinosus*. In *L. glutinosus* the spire is not depressed as in *L. involutus*, but forms a slight projection, and the mantle covers the entire shell, which is as fragile as that of *L. involutus*, but slightly larger. *L. glutinosus* occurs in Lake Bald and other mountain tarns in North Wales, but does not appear to be so exclusively an alpine species as *L. involutus* or *L. Burnettii*. It seems probable that *involutus* is the representative of one or other of these species, the remnant of a colony which may have reached Killarney in glacial times, dwarfed by unfavourable climatal conditions, but still holding out in its mountain fastness.

I have elsewhere drawn attention to the northern character of the insect fauna of the South of Ireland: excluding insects of universal occurrence, the number of species of Lepidoptera which are common to the North of Scotland and the South of Ireland is very striking. I may mention, in illustration of this, the following Lepidoptera found in Kerry and Perthshire, and mostly common in both places, of which the majority are unknown in Southern England:—*Cœnonympha Typhon*, *Sesia scoliaeformis*, *Bombyx Callunæ*, *Acronycta Myricæ*, *Hadena rectilinea*, *H. contigua*, *Calocampa exoleta*, *C. vetusta*, *Acidalia fumata*, *Dasydia obfuscata*. And when the insect does occur in all three divisions of the United Kingdom, and has a northern variety, as in the case of *C. Davus* (*Typhon*), *Bombyx Quercus* (*Callunæ*), it is the Scotch and not the English form which occurs in the South

of Ireland. But there occur with these species, at Killarney, others of a different character, which warn us against hasty conclusions, and indicate how fragile is the thread by which we attempt to feel our way into the darkness of the past. *Argynnis Lathonia*, *Notodonta bicolor*, *Ophiodes Lunar*^{is}, *Bankia argentula*, *Sterrhia sacraria*, *Pterophorus isodactylus*, and *Mesites Tardii*, have certainly not reached Killarney from the north. Apparently we have here immigrants from various quarters, races which fought for Irish soil long before Celt or Saxon existed to quarrel about it; but many more facts are wanted before it can be said whether northern or southern species were the first settlers, or under what circumstances so singular an assemblage of insects has occurred.

I do not wish to depreciate what are termed the "life-histories" of insects, of which so many have lately appeared; they are doubtless valuable contributions to knowledge, and not the less valuable because their aim is limited; but how far is the best life-history from explaining the many problems involved in the existence of the smallest creature! The colour or shape of an insect's wing may have had its origin, and bear definite relations to changes, in the outline of mighty continents which have influenced its distribution; but the characters in which these life-histories are written by Nature's hand are at present mostly beyond our power to decipher. In the same way every line and crack on the bark of a tree may, nay must, be the result of summer's sunshine, of winter's storm, or of some other actual incident in the existence of the tree: we may indeed conceive of an Intelligence that could read every line of the history thus recorded, but how utterly does the problem set human faculties at naught!

The entomological wanderer will not omit to visit

" — Innisfallen, of the islands queen,
Where heavenly meditation musing dwelt."

If he wants *Mesites Tardii* it occurs on Innisfallen, under the bark and in the wood of the decaying trees, in prodigious numbers; on the mainland also, but very sparingly: it is a creature of extremely sluggish habits, and, although not exactly wingless, its very short and unfolded, I might say rudimentary, wings are certainly useless for the purpose of flight; so that the colony on the island has not been thinned

by migration, and in the lapse of time has so multiplied as to threaten its own extinction by the destruction of all the timber which serves to support it.

The best collecting-ground for the Lepidopterist at Killarney will be found on the bogs round the upper lake, especially those under Cromaghlán Mountain and near Derrycunihy Waterfall, and in the woods which fringe them. These bogs are mostly covered with a thick growth of *Myrica Gale* and *Calluna vulgaris*, and in ordinary summers are firm enough to be traversed safely in all directions.

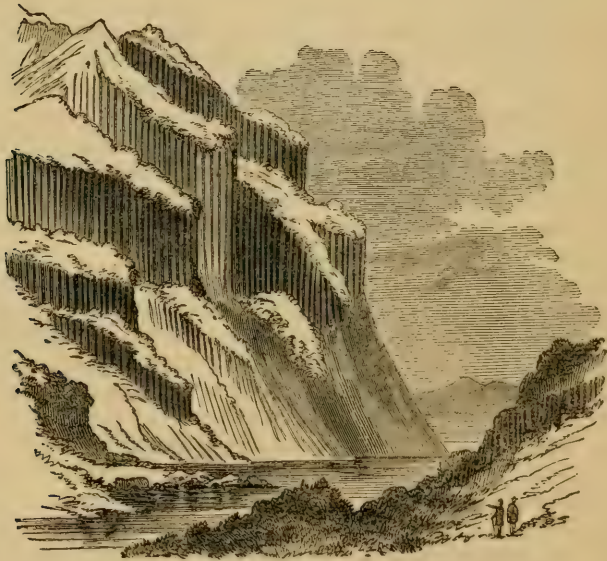
The following list comprises a few of the most interesting species which have been taken at Killarney:—*Argynnis Lathonia* (Muckross), *Melitæa Athalia*, *Thecla Betulæ*, *Vanessa Antiopa* (Loch Carragh), *Sesia culiciformis* (Cromaghlán), *S. scoliæformis* (Cromaghlán), *Lithosia aureola*, *Notodonta bicolor* (Muckross), *N. chaonia* (Muckross), *Bombyx Callunæ*, *Geometra papilionaria*, *Acidalia rusticata* and *A. fumata*, *Corycia temerata*, *C. taminata*, *Macaria notata*, *Selidosema plumaria*, *Sterrhæ sacraria*, *Dasydia obfuscata*, *Scoria dealbata*, *Emmelesia tæniata*, *Eupithecia arcenthata* and *E. debiliata*, *Lobophora viretata*, *Acronycta Myricæ* (Loch Carragh), *Noctua neglecta*, *Hadena rectilinea*, *H. contigua*, *Calocampa vetusta*, *C. exoleta*, *Ophiodes Lunaris* (at sugar under Cromaghlán), *Plusia Festuæ*, *Bankia argentula*, *Hydrelia unca*, *Erastria fuscula*, *Hypena crassalis*, *Schrankia turfosalis*.

The most interesting of the above-named insects, *Notodonta bicolor*, I have never been fortunate enough to capture, though I have made several journeys to Killarney with that object. A man is apt to suffer in fame if he finds a species that cannot be discovered again, and something of this sort was poor Bouchard's fate in connexion with his discovery of *bicolor* at Killarney. The capture of specimens of the insect, both in the larva and imago state, during the summer of 1866, I am glad to say removes any ground of doubt as to its truly indigenous character: all the specimens yet taken have been beaten from birch trees on Muckross peninsula early in June. That this conspicuous insect should be so difficult to find appears strange, but it must be considered that it is not common anywhere in Northern Europe, and that the habits of the perfect *Notodontidæ* are very retired:

there are several of the British species, reported common, which in twenty years' diligent collecting I have never yet seen at large.

The Mangerton or southern range of mountains is, like the Reeks, indented by numerous and deep glens: in some cases valleys of 2000 feet or more in depth have been excavated, and in Glen Cappagh and the Horses Glen, about five miles south-east of Killarney, this denudation has disclosed an extraordinary scene of ancient igneous action; beds of trap-rock are exposed to view, the work of a submarine volcano which was finally choked and covered up in the deposits of the old red sandstone sea.

In the midst of this ancient field of lava is the detached hill of Beanaunmore, a mass of columnar basalt, which appears



Basaltic hill of Beanaunmore.

to occupy the centre of eruption: it probably, as molten lava, filled the crater of the old volcano, and now stands in solitary grandeur, a cyclopean casting, of which the mould has

been broken and swept away. The columnar structure is distinctly seen: its sides and some of the columns, which are generally five or six-sided prisms, appear to be 200 feet in height.

This remarkable volcanic region was first noticed in 1855, by Mr. Frederick Foot, of the Geological Survey, and, not having yet got into the guide-books, is scarcely known, and more rarely visited than it deserves to be, for it needs not to be a geologist to appreciate the grandeur of these basaltic cliffs, or the beauty of the wild glens amidst which they are placed.

Volcanoes and ice seem strangely out of accord with the present aspect of Killarney, shrouded in evergreen woods of almost tropical luxuriance; but there is no doubt those mighty agents, frost and fire, have aided to produce the present beautifully varied outline, upon which the eye never tires of resting, and it may even be that the rude forefathers of our race saw it in the icy dress which is now difficult, even in imagination, to restore.

EDWIN BIRCHALL.

Bradford, Feb. 1, 1867.

A Revision of the British Species of the Genus Bombus.

By FREDERICK SMITH, Esq.

(Continued from p. 243).

The nests of the surface-building Bombi may be taken without any chance of their making a formidable resistance; the moment their dwelling is disturbed a sudden panic appears to render them incapable of defending their domicile: this has been my experience as regards the dwellings of *Bombus senilis*, *B. Sylvorum*, *B. Derhamellus*, *B. Pratorum* and *B. fragrans*.

The size of the nests, and consequently the number of their inhabitants, depends, in the first instance, upon the period of the season when it is discovered; in early summer the communities are small, but they increase as the season advances. Mr. Shuckard says they have two broods during the season: such a statement is directly opposed to my own

experience, and also to that of every hymenopterist whom I have consulted. Males and females are developed in the autumn alone, and, as I believe, only a single brood in the same nest during the season. The number of bees forming the autumnal colonies, when nests contain all the sexes, and when they are most numerously populated, is greatly dependent upon the kind of season when they are examined: if the season has been fine, dry and hot, colonies will reach their maximum; but a wet season has a contrary effect. A populous colony of *Bombus senilis* would not contain less than two hundred bees, probably about twenty being females, forty males, and the rest worker or neuter bees.

The smallest colonies appear to be those of *Bombus Sylvorum* and *B. fragrans*; those of *B. Muscorum* usually the largest: these remarks apply solely to the surface-building bees.

The nests of under-ground builders are much more populous, and the majority of them are a pugnacious and courageous race: *Bombus terrestris* and *B. lapidarius* resist an attack upon their citadel with the well-known impetuosity and determination of a wasp or hornet, whilst nests of *Bombus Latreillellus* may be dug out with impunity. The most populous communities, as far as my experience enables me to judge, are those of *B. terrestris* and *B. Lucorum*.

My own researches have led me to the following conclusions:—Humble bees have only one brood during the season: a single female, that has passed the previous winter in a state of torpidity, is the foundress of the colony; for some time workers only are developed in the nest, but, as autumn approaches, the other sexes appear: towards the end of autumn all the community quit the nest; the females, being impregnated, to seek for some secure place in which to hibernate during the winter; the males and working bees, to perish.

The time at which the different species complete their labours differs in various species; thus *B. Pratorum* usually completes her task earlier than any other species: males sometimes appear at the end of May, whilst that sex of *B. terrestris*, and of the majority of the other species, are not found until the latter part of August.

It has been stated that if a male *Bombus* once leaves the

nest it never returns to it, but observation proves this opinion to be erroneous; the habit of *Bombus Latreillellus* is diametrically opposed to it: at that time in the autumn when the males and females appear, if the burrow leading to a nest of this species be watched, a number of males will be observed flying about the entrance, and they will be seen occasionally to re-enter: these males are waiting the exit of the females; no sooner does one of that sex issue forth than a number of the males start off in eager pursuit of her. Shuckard states that female humble bees assume a variety of seductive ways to allure the males, settling on leaves, vibrating their wings, and otherwise courting the attention of the other sex: such a mode of procedure is diametrically opposed to my own observation, not only of the genus *Bombus*, but of the species composing the entire family of the *Apidæ*. My own experience teaches me that it is the habit of all female bees to endeavour to escape the pursuit of the males. The hive-bee is pursued by a host of males, out of which only one would appear to copulate with the female: I possess a drone and a queen that were observed to drop, *in copulâ*, on to the pathway of a garden, in which state they were sent to me by a relative; the female was alive, but the drone was dead, when they came into my hands. The common spring bee, *Anthophora*, will be observed flying from flower to flower, the male in constant chase of the female, the latter apparently ever anxious to outstrip her partner by flight. The sexes of *Anthidium* will also be frequently observed one chasing the other; indeed I cannot recall a single instance of a contrary habit. The copulation of the sexes of the *Bombi* is a circumstance only to be observed at rare intervals.

The *Bombi* are the largest and handsomest bees found in this country; but the most beautiful species are those of Chili, India and Mexico: *Bombus hæmorrhoidalis* and *B. orientalis*, from India, and *B. Dahlbomii*, from Chili, are much larger and more brightly coloured than any of our native species; but *B. formosus* is perhaps the handsomest of the genus.

Mr. Kirby states that he knew "no family of which it is more difficult to distinguish the species than the present:" this is true, but the males are much more subject to vary in coloration than the other sex; but the difficulty in the latter

case is overcome by an inspection of the organs of generation. Audouin, in 1821, published a paper on this subject in the eighth volume of the *Annal. général des Sc. Physiq.*; therefore to him is due our knowledge of this excellent character for specific distinctions, and not to the author of the recent work on 'British Bees,' who says, "This character, which I was the first to discover as being of specific value." The females and worker bees are tolerably constant in their colouring, and study and observation soon render the student familiar with their differences.

LIST OF SPECIES.

1. <i>Bombus Muscorum</i>	13. <i>Bombus Soroensis</i>
2. " <i>senilis</i>	14. " <i>lapidarius</i>
3. " <i>Smithianus</i>	15. " <i>terrestris</i>
4. " <i>fragrans</i>	16. " <i>Lucorum</i>
5. " <i>Sylvarum</i>	17. " <i>Hortorum</i>
6. " <i>lapponicus</i>	18. " <i>Latreillellus</i>
7. " <i>Pomorum</i>	19. " <i>subterraneus</i>
8. " <i>Derhamellus</i>	
9. " <i>Pratorum</i>	1. <i>Apathus rupestris</i>
10. " <i>Cullumanus</i>	2. " <i>vestalis</i>
11. " <i>nivalis</i>	3. " <i>campestris</i>
12. " <i>Scrimshiranus</i>	4. " <i>Barbutellus</i>

EXPOSITION OF THE SPECIES OF THE GENUS *BOMBUS*, DESCRIBED IN THE 'MONOGRAPHIA APUM ANGLIÆ,' BY KIRBY.

74. <i>Apis Muscorum</i> , female	=	<i>Bombus senilis</i> , female
Var. β ., female, minor		" "
" γ ., neuter		" "
" δ ., ϵ ., neuter; neuter, minor		" "
Male, major		" "
Var. β ., male; γ ., male, immature		" "
75. <i>A. Francillonella</i> , neuter		" <i>Muscorum</i>
76. <i>A. floralis</i> , female		" "
Var. β ., neuter (var.)		" "
Male		" "
77. <i>A. Sowerbiana</i> , male		" "

78. <i>A. Beckwithella</i> , female	=	<i>Bombus Muscorum</i>
Var. β ., neuter	"	"
79. <i>A. Curtisella</i> , male (var.)	"	"
80. <i>A. Fosterella</i> , neuter	"	"
81. <i>A. Agrorum</i> , female (var.)	"	"
82. <i>A. Sylvarum</i> , female	"	<i>Sylvarum</i>
Var. β ., neuter ; γ ., neuter, major	"	"
" ϵ ., neuter, minor	"	"
Male	"	"
Var. β ., male	"	"
83. <i>A. fragrans</i> , male	"	<i>fragrans</i>
84. <i>A. Latreillella</i> , male	"	<i>Latreillellus</i>
85. <i>A. Rossiella</i>	<i>Apathus</i>	<i>campestris</i>
86. <i>A. Leeana</i> , male	"	"
87. <i>A. Franciscana</i> , male	"	"
88. <i>A. campestris</i> , female	"	"
89. <i>A. Lucorum</i> , male	<i>Bombus</i>	<i>Lucorum</i>
90. <i>A. Zonella</i> , male	"	<i>Scrimshiranus</i>
91. <i>A. hortorum</i> , female	"	<i>hortorum</i>
Var. β ., female	"	"
" γ ., neuter, major	"	"
" δ ., neuter, minor	"	"
Male	"	"
Var. β ., male, minor	"	"
92. <i>A. Scrimshirana</i> , female	"	<i>Scrimshiranus</i>
Male	"	"
93. <i>A. Barbutella</i> , female	"	<i>Barbutellus</i>
Male, major	"	"
Var. β .; γ ., male, minor	"	"
94. <i>A. Tunstallana</i> , female	"	<i>subterraneus</i>
Var. β ., female	"	"
" γ ., female	"	<i>Latreillellus</i>
" δ ., neuter	"	"
" ϵ ., neuter, minor.	"	"
95. <i>A. vestalis</i> , female	<i>Apathus</i>	<i>vestalis</i>
Male	"	<i>Barbutellus</i>
96. <i>A. virginalis</i> , neuter	<i>Bombus</i>	<i>Lucorum</i>
Var. β ., neuter	"	"
Male	"	<i>terrestris</i>
97. <i>A. terrestris</i> , female	"	"
Var. β ., neuter	"	"
" γ ., female	"	"

Var. δ ., female	= Bombus terrestris
" ϵ ., female	" "
Male	" "
Var. β ., male	" "
98. A. Soroensis	" subterraneus
Var. β ., neuter, minor	" "
89. A. subinterrupta, female	" Pratorum
Var. β ., female	" "
Male	Apathus rupestris
100. A. Donovanella, female	Bombus Callumanus
Male	" Derhamellus
101. A. Burrelliana, male	" Pratorum
102. A. Cullumana, male	" Cullumanus
103. A. Pratorum, female	" Pratorum
Var. β ., neuter	" "
" γ ., neuter, minor	" "
104. A. Albinella, male	Apathus rupestris
105. A. Derhamella	Bombus Derhamellus
106. A. lapidaria, female	" lapidarius
Var. β ., neuter	" "
" γ ., neuter, minor	" "
107. A. Raiellus, female	" Pratorum
Male	" "
108. A. rupestris, female	Apathus rupestris
109. A. subterranea, male	" campestris
110. A. Harrisella, female	Bombus subterraneus
Male	" "

FREDERICK SMITH.

(To be continued).

Entomological Notes and Captures.

White Spot in the Red Band of Vanessa Atalanta—A few years since I reared from the larva a fine female *V. Atalanta* having a very decided white dot in the red band of each upper wing; the dot appeared distinctly through the shell or wing-case of the pupa the day before the butterfly emerged.

—*C. George Websdale; The Square, Barnstaple.*

[I believe the white spot in the red band is universally

described and regarded as an indication of the female: my own specimens support this opinion, but I shall be glad to have the experience of others.—*E. Newman.*]

Abundance of Bryophila glandifera Larvæ.—Have any of your correspondents observed the unusual abundance of the larvæ of *B. glandifera* this season? The old lichen-covered walls are profusely dotted with their domiciles, which I presume is in consequence of the late very wet autumn. Does *Perla* appear to be in unusual numbers this season?—*Geo. C. Bignell*; 8, Clarence Place, Stonehouse, Plymouth, March 12, 1867.

The Ricino Silkworm.—The ‘Western Morning News’ of October 21st, 1862, contained the following paragraph:—“Eighty specimens of a hardy description of silkworm, the *Gusano Ricino*, were introduced scarcely eight months ago, and at the present time they are counted by millions, being the result of five generations in this short space of time. The *Ricino* plant, upon which they feed, grows spontaneously in the country (River Plate, Monte Video), and of such fine quality for the food of the worms. Cocoons superior to those in Europe and China. Specimens of cocoons are expected in England next mail.”—*Id.*

Acidalia interjectaria of Boisduval a British Insect.—Two or three years since I obtained specimens of an *Acidalia* from Cambridgeshire which appeared to me to be *interjectaria* of Boisduval, but as they were rather wasted I thought it better to wait till I procured others before I said anything about them. Last summer I received three or four perfect specimens, and upon comparing them with a series of *interjectaria* which I received from Dr. Staudinger, in January, I was convinced that my British specimens belonged to this species; but in order to remove all doubt upon the subject I sent one of them to my kind friend M. Guenée, who said it was *interjectaria* and common at Châteaudun. This species is closely allied to *osseata* and *holosericata*: it differs from the first in the form of the wings, which are more rounded, and in the colour of the costa, which is pale brown and not rufous; there is also a conspicuous dark spot in the middle of the costa, and another nearer the base, which do not exist in *osseata*. It differs from *holosericata* in having a distinct central black dot on the four wings, both above and below,

which is always wanting in this species. M. Millière has given beautiful figures of *osseata* and *interjectaria*, with the larva and pupa of each, in the last Part of his '*Iconographie et Description de Chenilles et Lépidoptères inédits.*'—*Henry Doubleday; Epping, March 13, 1867.*

Stylops emerging five months after the Death of the Bee.—On the 18th of July, 1866, I captured, at Ipswich, a male of *Andrena convexiuscula*, the abdomen of which was much distorted with a *Stylops* on the left side, about the junction of the third and fourth segments. On returning home I placed it in my collection, and on the 4th December last put it in a pocket-box by itself, in order to name it, as I was not then certain of the species. On opening the box on the 13th December I was astonished to find a living male *Stylops*, which had evidently just emerged from the bee. The pocket-box had never been used before.—*G. A. James Rothney, Queen's Road, South Norwood, February 2, 1867, in Ent. Mo. Mag. iii. 235.*

New Species of Scoparia.—In the 'Entomologist's Monthly Magazine' for March, Dr. Knaggs describes a *Scoparia* supposed to be new, under the name of *S. ulmella*, of which the most striking characters are "the long narrow fore wings; with slightly acute apices; the well-defined broad arched first line, in which two of the stigmata are nearly absorbed; the very characteristic renal stigma, 8-shaped and filled in with ochreous; the apical margin furnished with dots and dashes; the shape of the hind wings, which are comparatively long, and slightly emarginate just below their apices." Three specimens were taken by Mr. Dale "on the 13th of July, 1844, on a wych-elm trunk in a thick wood at East Meon, adjoining Bordean Hanger, Captain Chawner's estate," and two of these are still in Mr. Dale's collection. The following particulars would be additionally interesting:—Have the specimens been seen and examined by Mr. Doubleday? Have they been compared with the figures of the genus in Herrich-Schæffer?

Varieties.—I shall be extremely obliged for drawings, or, better still, for photographs, of any remarkable varieties of *Lepidoptera*: they will be published in the "Illustrated Natural History of British Moths," which will appear in monthly numbers.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 41.]

MAY, MDCCCLXVII.

[PRICE 6D.

Variation in Lepidoptera. By C. S. GREGSON, Esq.

(Continued from page 213).

Vanessa Urticæ. I said, in the beginning of this paper, that this abundant species was generally constant in its characters; and were I to attempt to describe all the aberrations of it in my collection after so saying, without explaining that my specimens were the result of many years' careful examination of very many thousands of bred and captured specimens, it might seem paradoxical how so many strange forms could be in one cabinet, and it yet be a constant species. No word-painting of mine can give an adequate idea of the singularity of two or three of them. From thirty-two specimens in my collection, few of which are typical in their characters, I will try to give the peculiarities of the most striking. Four are of great expanse, measuring above two inches and a quarter, and are particularly bright-coloured; captured near Preston. One large, dark, the inner marginal blotch large, oval, and the two ordinary spots fairly enclosed within dark nerval lines; these dark lines are well defined upon all the lower nerves of the superior wings, and are also seen upon the lower nerves of the inferior wings: the ordinary blue marginal spots die out below the discoidal nerves in the superior wings, leaving a well-defined dark marginal striga, through which the dark nerval lines pass, and are well developed through the cilia; the latter is dark at the apex of the wing, but grows lighter towards the internal angle: the blue spots are well represented upon the under wings. Next to this is an ordinary-sized specimen, the dark markings in which are so generally small that the ground colour (which is light bright orange-yellow) predominates over a greater space than usual, and thus gives the specimen a bright and light character not often seen; the outer margin to cilia dark, and below that is another, the ordinary dark markings being normal, the ground colour even brighter than the last and

running close up to the thorax, the dark margin narrow, the blue spots almost obliterated on the upper wings, and having a broad very light cilia margin: the sharp cutting of the dark markings in this specimen serves to throw up the bright ground colour more conspicuously, and the broad light cilia margin gives a tone to it which I have not seen in any other specimen. Under it, in contrast to its lightness and clearness, is an excessively dark suffused specimen; sub-basal, central, costal and inner marginal blotches joined together; the two outer spots confluent, and the outer marginal band and cilia suffused together, forming a broad margin, in which the blue marks are discernible as small round dots; below that again is another darker still, and even more suffused, but the two outer spots are not joined together, and there is an approach to nerval markings on all the wings, and the blue spots are still fewer and less distinct: in the above two specimens the central costal and the inner marginal dark blotches are joined together by a suffused dark mark; there is a series of large cuneiform blue markings, one within each nerval space, on the sinister or left upper wing; the ground colour is more generally suffused with dark scales, the nerves well defined, but the outer dark striga is of equal width throughout, and the blue markings less arrow-shaped; the right under wing dark brown, with three small faint reddish marks pointing upwards from the lower part of the wing, and the ordinary blue markings well developed in the usual way; whilst the left under wing is dark brown, except near the lower part, where there is a narrow deep red patch, through which three dark nerves pass; on entering the outer marginal striga they become broader and pass through the cilia, giving quite a distinct forked appearance to the wing: the general appearance of this specimen is that of a dark suffused rayed insect. Below this is a specimen in which the two upper wings are as in ordinary specimens as far as the outer dark striga, except that the costal line is very dark and joins the costal blotches together, but the outer dark band is cut through between each nerve with long blue blotchy streaks, the dark streaks between them being very conspicuous; the under wings are dark dull brown, with a faint reddish suffused shade on one of them, but without any outer marginal line or any of the typical blue spots; cilia indistinct. We now come

to another type-specimen, a large female; ground colour equally rich with the above, but the two light costal patches, which are very small and dark in the others, are large and light in this type, and the dark markings are large and intensely black; the central costal and the inner marginal blotches are both continued to the medial or discoidal nerve, where they meet and form a distinct central wavy or incurved fascia; the two discal spots large, round and distinct; the outer margin and cilia dark; blue spots on superior wings almost obsolete, whilst on the inferior wings they are better defined; the apical white spot small and narrow, suffused with dark scales, whilst the inner blotch-like patch, scarcely seen in the two specimens above, is, in the specimen under consideration, brightly and largely defined; and this light colour is strongly developed upon the under wings. Hitherto I have only spoken of specimens which are regularly marked alike on each side; but we now come to the singular specimens named above. One of these, a female, has the dexter or right-side superior wing slightly suffused upon the disk; all the nerves dark; the outer dark marginal striga broad, especially near the apex, where it widens out so as to take in the outer costal dark blotch and through this broad part. Distinctive characters: the two discal spots and the light suffused blotch upon the outer edge of the lower dark blotch, and at the upper edge of the dark portion of the under wings obtains a greater intensity of brightness in its colours; for as yet these are the only characters I have seen in which it differs from *V. Ichnusa* of our continental collections: they are said to vary in shape, &c., but as *V. Urticæ* differs in shape also, this assertion does not count for much; but this is not the question for this paper; I therefore merely record the following forms in my collection, and leave to others more able a question I am so unprepared to discuss:—One large female, measuring two inches and one-eighth; brilliant colours; every character upon it well defined, except the two discal spots, one of which is obliterated and the other a small lunule, on both wings; the outer marginal striga is narrow, and vandyked round the blue lunules on the upper portion of the upper wings; lower down it is only a dark streak-like mark, but upon the lower wings it is broad, dark, and contains within it a series of six of the largest blue

markings I have ever seen upon any specimen: the brilliancy of the ground colour of this specimen and the almost obliteration of the discal twin spots strikingly remind one of *Ichnusa*; and did not the light patch on the edge of the inner blotch call forcibly back the remembrance of *Urticæ*, few would doubt but that this specimen and the Corsican insect were one, especially so on examining two specimens below it, which, though not so large in alar expanse or so brightly coloured, are entirely devoid of the twin discal spots, and almost without the light shade at the edge of the inner marginal blotch; in fact they are, though perhaps a little less solid in the ground colour, veritable *Ichnusa*-looking specimens.

Vanessa Cardui. One specimen only, measuring about one inch and three-fourths in alar expanse; one very large specimen, the ground colour being yellow, and the spots on the under wings small.

Satyrus. The members of this genus are little liable to sport in the form of their markings, but often vary much in the brightness or intensity of colour; the tendency to greater intensity and brightness is seen as we go south, until, for instance, *S. Semele* becomes a bright reddish ochre in Corsica, and is there called *S. Aristæus*; whilst here it rarely has any reddish ochre colour upon it, except in very hot summers. At Howth, in Ireland, I have repeatedly observed them much lighter than in England, and I possess a fine female I captured there in 1866, very light, and having a small dark dot between the two ordinary ones upon the superior wings. I need not take up space with the other members of this genus, further than to say that, of those which differ in the number and intensity of the ocelli, I possess striking aberrations, and have also some of the silvery forms of *S. Janira*; but as these belong to the manufacturable varieties I refrain from enumerating them.

Chortobius Davus. Of this variable species I have a long series, from one inch in expanse to one inch and five-eighths, and varying in colour from dark dull brown to light creamy fawn-colour, and from immaculate to almost margined with distinct ocelli, varying on the under side quite as much and more strangely than upon the upper. The dark specimens have all been taken upon the wet portions of our mosses, and the light ones upon the drier parts and in hot seasons.

C. Pamphilus. One female, measuring one inch and a half across the wings.

Of our remaining species of butterflies I have no varieties, nor have I seen any worth recording, except perhaps some *Syrichtus Alveolus* in the collection of T. H. Allis, of York.

I am indebted to Mr. Doubleday for specimens of *Satyrus Aristæus*, and for many other interesting continental species, and for much useful information about the food and habits of *V. Ichnusa*, &c.

[I should feel greatly obliged to Mr. Gregson for a copy of any photograph he may take of his extraordinary varieties. I know that Mr. Gregson's success in this art has been very great, and I should be glad to obtain his permission to introduce figures of these varieties into my illustrated 'Natural History of British Moths.'—*E. Newman*.]

C. S. GREGSON.

(To be continued).

A Revision of the British Species of the Genus Bombus.

By FREDERICK SMITH, Esq.

(Continued from p. 260).

1. *Apis Muscorum*, *Linn. Faun. Suec.* p. 427, female.
Bombus Muscorum, *Fabr. Syst. Piez.* p. 349; *Dahlb. Bomb. Scand.* p. 46; *Drews. & Schiödte, Bomb. Denm.* ii. 108; *Smith, Bees Great Brit.* p. 212; *Nyland. Revis. Ap. Boreal.* p. 260; *Schenck, Bees of Nassau*, p. 156.
- B. *Mniorum*, *Fabr. Syst. Piez.* p. 350, var. neuter. B. *senilis*, *Syst. Piez.* p. 352, neuter. B. *pygmæus*, p. 353, neuter.
- Apis floralis*, *Kirby, Mon. Ap. Angl.* ii. 321, female, male. A. *Beckwithella*, *Mon. Ap. Angl.* ii. 323, female, neuter. A. *Agrorum*, *Mon. Ap. Angl.* ii. 326, female.
- A. *Sowerbiana*, *Kirby, Mon. Ap. Angl.* ii. 322, male. A. *Curtisella*, p. 324, male, var.
- A. *Francillonella*, *Kirby, Mon. Ap. Angl.* ii. 319, neuter. A. *Forsterella*, p. 325, neuter, minor.

I have obtained the small dark variety of the worker of this species from a nest taken at Walmer: this form appears to be common in Sweden and Denmark, and would probably occur in Scotland, but is very rare in the South of England. The typical examples of *senilis* and *pygmæus* have been examined by that accurate observer Dr. Nylander, so that no doubt can arise of their identity with this species. Found in all parts of the country.

2. *Bombus senilis*, *Smith, Bees Great Brit.* p. 214 (*nec Fabr.*)

Apis Muscorum, *Kirby, Mon. Ap. Angl.* ii., female, male, neuter, 317; *Don. Brit. Ins.* xi. 70.

Bombus cognatus, *Steph. Supp. Brit. Ent.* vii. 17.

B. Muscorum, *Westw. Nat. Libr.* xxxviii. 253; *Schenck, Hym. Nassau*, p. 156, 11.

This species I at one time was led to consider, judging from the terms of the description, and also from the examination of a specimen in the Banksian collection, to be the "senilis" of Fabricius; but, as I have already shown, that insect is, on Dr. Nylander's authority, a mere faded example of *B. Muscorum*. Under these circumstances I have thought it best to retain the name used in my book on the 'British Bees.' Found in all parts of the country.

3. *Bombus Smithianus*, *White, Proc. Linn. Soc.* (1851; *Ann. & Mag. Nat. Hist.* x. new ser. p. 294; *Smith, Bees Great Brit.* p. 215.

This species was discovered in Shetland by Mr. Adam White, where it has subsequently been taken by the late Mr. Squire, and recently, in abundance, by Mr. Rich: it is closely allied to the *B. arcticus* of Dahlbom, but, having obtained that insect from Prof. Schenck, of Nassau, and having had a series from Copenhagen forwarded by Mr. Drewsen for examination, I am satisfied of their being distinct species: the pubescence that clothes the body of *B. arcticus* beneath is pale; in *B. Smithianus* it is black. I have obtained the nest of this species containing all the sexes. Only hitherto found in Shetland.

4. *Bombus fragrans*, *Illig. Mag.* v. 165; *Dahlb. Bomb. Scand.* No. 46; *St. Farg. Hym.* i. 464; *Drews. & Schiödt, Mon. Bomb.* p. 171; *Smith, Bees Great Brit.* p. 216; *Nyl. Ap. Boreal.* p. 229.

Apis fragrans, *Kirby, Mon. Ap. Angl.* ii. 329, male.

This species is local, and not very frequently found in the South of England; in the northern counties it is much more abundant: it is a common insect about Halifax and the neighbourhood of Wakefield, where I have found its nest in grass fields and on hedge-banks.

5. *Bombus Sylvarum*, *Illig. Mag.* v. 163; *Fabr. Syst. Piez.* p. 348, 27; *Dahlb. Bomb. Scand.* No. 44; *St. Farg. Hym.* i. 463; *Drews. & Schiödt, Bomb. Denm.* p. 109; *Smith, Bees Great Brit.* p. 217; *Nyland. Ap. Boreal.* p. 236; *Schenck, Hym. Nassau*, p. 158.

Apis Sylvarum, *Scop. Ent. Carm.* No. 822; *Kirby, Ap. Angl.* ii. 362, female, neuter, male.

Found in all parts of the country: its nests are usually found on the ground beneath bushes, and, as I have observed, always sheltered and more or less concealed: its communities are not very numerous.

6. *Bombus lapponicus*, *Fabr. Syst. Piez.* p. 345, 11; *Dahlb. Bomb. Scand.* No. 41; *Zett. Ins. Lapp.* 474; *St. Farg. i.* 459; *Smith, Bees Great Brit.* p. 218; *Nyl. Ap. Boreal.* 235.

Bombus regelationis, *Newm. Ent. Mag.* ii. 327.

Mr. Newman first discovered this species in this country, on the Black Mountain, Llantony Abbey, Brecknockshire. It has subsequently been taken in various localities in Wales, but in the greatest numbers at Loch Rannoch, in Perthshire, from whence I have obtained fine series of all the sexes: I have also obtained it from Lapland, Norway and Sweden.

FREDERICK SMITH.

(To be continued).

Life-history of Depressaria carduella, Hubner. — This insect has long held a place in our lists as a great rarity, and its life-history has always been regarded as a thing to be hoped for, until the matter was solved by Mr. J. B. Hodgkinson, who wrote to me announcing that he had found a larva mining the leaves of thistles on Millbarrow Scar, in Westmoreland. I immediately hastened to meet him, that I might secure examples of it *in situ*. In this locality, where sheep only can live, Mr. Hodgkinson showed me the larvæ,

which were evidently materially checking the growth of the thistles, which would otherwise choke up every green thing on land so suited to their development, but where few husbandmen could or would go to work. The larva mines the leaves of *Cnicus lanceolatus* and other thistles, in June, sometimes many in each leaf: they remove freely from plant to plant, generally moving upwards: they are long and cylindrical in shape, and generally of a dull green, but variable in colour, having a dark head and corslet [the dorsal area of the 2nd segment], and a dark anal spot; they are rather hairy, the hairs springing from minute dark marks, six on each side of each segment, *i. e.*, three on each side of the dorsal line: spiracles distinct: when full-fed the dark corslet is divided by a median line. The perfect insect appears in July, and has been found by me on Millbarrow as above, and also at Conway, Llandudno and Llanferris, in North Wales: it expands from five to eight lines: upper wings bright yellowish pinky red, covered with darker atoms; on the disk of the wing before the middle are two dark dots; there is also a dark blotch, with a darker mark inside it: under wings dull, without markings: cilia pale. — *C. S. Gregson.*

Entomological Notes and Captures.

White Spot in the Red Band of Vanessa Atalanta. — Mr C. G. Websdale (Entom. iii. 260) seems to think that the white spot in the red band on the fore wings of *V. Atalanta* is of uncommon occurrence. I am of opinion it always occurs in females: I have never seen it in males. I used to take *Atalanta* in profusion on Great Haldon, South Devon, and all the females I caught bore this white spot. Out of a pair I took *in cop.* one was without this indicating spot and the other with it, thereby proving the female alone to possess it. — *F. Wilkinson; High Street, Market Harborough, April, 1867.*

White Spot in the Red Band of Vanessa Atalanta. — I have three specimens of *Atalanta* with very decided white spots in the red band, in one case as large as the small spot at the tip of the wing, and a fourth having the white spot only on the left wing, and the bands on both wings divided

by a broad black line. If these spots are the distinguishing mark of the female, is this last case an instance of external hermaphroditism similar to that which occasionally occurs in *Lycæna Alexis*?—*Yeend Duer, Cleygate House, near Esher.*

Beetles in Australia.—According to the Melbourne papers just received, enormous swarms of beetles have been noticed lately in Victoria, Australia. In the early part of January a swarm was noticed near Ararat, Victoria, flying in a column about twenty yards broad, and keeping in compact order. They cast a dark shadow on the ground, and they were about an hour in passing the spot from which they were seen. At a certain point they turned off at right angles. The Eucalypti in the neighbourhood of these insects had been stripped of every particle of foliage. Great numbers of the beetles fall to the ground during the flight. The noise they make while flying is like that of a hurricane playing in the rigging of a ship. The colour of these beetles is a dark bronze.—*'Yorkshire Post,' March 30, 1867.*

[Are these winged species of *Paropsis*?—*E. N.*]

Mould on Lepidoptera.—Some time ago I solicited a method of checking mould on the wings of Lepidoptera, and of removing it when already there, and was subsequently informed by Mr. Crotch (Entom. iii. 72) that a mixture of carbolic acid with benzine would, if applied to the insect, prevent mould being formed, and would check it if in a state of infection. I accordingly tried the experiment, and found it to answer very well, and have sincerely to thank Mr. Crotch for the information so kindly given. As I have succeeded tolerably well in getting rid of the worst enemy I think insect-preservers have to deal with, my mode of proceeding may be of some use to others. First of all I pin the moth or butterfly infected on a piece of cork, and place it before a fire at the distance of about a yard, and then brush the thickest of the mould off the wings and antennæ with a camel-hair brush. If, however, the mould is of long standing, and is so tenacious as not to be removed with a dry brush, I use one dipped in benzine, but am sorry to say have not succeeded so well in the latter instance. The object of placing the insect before a fire is to dry it thoroughly, and the mould, if not of long duration, will brush off like dust. After another warm at the fire I apply

the point of a steel pen dipped in the mixture of carbolic acid and benzine, above mentioned, to the top and under side of the thorax close to the pin, and also to the extremity of the body. I have found the above process to stop further formation of mould, and in many cases entirely remove it. It will, I have no doubt, admit of improvement when brought more generally into practice. I would mention that the greatest trouble is with very small insects, on account of the extreme tenderness of the wings and antennæ. These I soak entirely in benzine, and, with the exception of using the camel-hair brush, proceed as before. — *F. Wilkinson; High Street, Market Harborough.*

Economy of Ephestia semirufella. — I first saw this insect on the wing about ten years since, in-doors. I gave some specimens to several of my entomological friends, but they could not tell me the name: one or two say that they have seen it out-of-doors, but I never did: it makes its appearance early in June, and flies with a rising and falling flight for a long time: after this they are much wasted at the edges of the wings; they then copulate and deposit their eggs, and soon fall a prey to the spiders. Of the larvæ I cannot say much, except that I found them in a piece of new beech which I had laid in a dark corner: it had no larvæ in it when I laid it there. — *S. F. Cowan; 431, Hackney Road, April 15, 1867.*

Leaf-miner in the Cinerarias. — I have examined the larvæ and pupæ sent me by Miss Sullivan, and believe them to be those of Diptera; and Mr. Stainton, who has kindly examined the specimens, coincides in this opinion. Nevertheless I shall be extremely obliged if any cultivator of Cinerarias will try to rear the insect, which can readily be done by inverting a tumbler over an infected leaf. — *E. Newman.*

Proceedings of the Entomological Society of London.

February 4, 1867. — Professor Westwood, Vice-President, in the chair.

The President (by letter) nominated as his Vice-Presidents Messrs. Westwood, Stainton, and Frederick Smith.

Mr. H. E. Cox, of Croydon, was elected a Member; and

Mr. Yeend Duer, of Cleygate House, Esher, an Annual Subscriber.

The Chairman announced that the Council had again resolved to offer two prizes, of five guineas each, for Essays, of sufficient merit and drawn up from personal observation, on the anatomy, economy or habits of any insect or group of insects especially serviceable or obnoxious to mankind. The Essays must be sent to the Secretary at No. 12, Bedford Row, on or before the 30th of November, 1867, when they will be referred to a Committee to decide upon their merits; each must be indorsed with a motto, and be accompanied by a sealed letter indorsed with the same motto and inclosing the name and address of the Author.

Mr. Bond exhibited four specimens, two males and two females, of a *Bombyx* bred by Mr. Robert Mitford from larvæ found on the coast of Kent: he regarded them as merely a variety of *Bombyx Trifolii*, differing from the normal form in colour and in the antennæ of the male, though he was informed that the larvæ also differed and were of a golden colour. The insect might be supposed to bear the same relationship to *B. Trifolii* that *B. Callunæ* bears to *B. Quercus*, and had very much the appearance to be expected in a hybrid between *B. Trifolii* and *Odonestis potatoria*. Other bred specimens of *B. Trifolii*, from Cumberland, Hants, Dorsetshire and Devonshire, were produced for comparison.

Mr. Bond also exhibited several *Fritillaries* with unequally developed wings; and a remarkable variety of *Dianthœcia capsincola* from York.

Mr. Bond offered an explanation of the curious habit of *Macroglossa Stellatarum* frequenting stone walls, &c., as to which an inquiry was made at the previous Meeting. The object was to secrete itself in some hole or crevice: he had often noticed that the insect had a morning and an afternoon flight, but in the middle of the day grew tired, when it would seek out a wall or bank and creep up it until it found a hole or cranny wherein to rest.

Dr. Wallace corroborated this: when residing in the Isle of Wight he had observed the humming-bird hawk-moth resting in crevices of mud banks, &c., and on one occasion he had captured in a limpet-shell a specimen which was thus reposing.

Dr. Wallace said that on recently looking through Dr. Bree's collection of British Lepidoptera he had detected a *Platypteryx Sricula* mixed up with *P. falcatoria*. The insect did not bear any label, and Dr. Bree had not any recollection of the capture of the particular specimen, though he had no doubt that it had been taken by himself some years ago, along with *P. falcatoria*, in the neighbourhood of Stowmarket. If so, this was a new locality for the species, which in this country had hitherto been known to occur only in the neighbourhood of Bristol.

Mr. Wallace remarked that Dr. Wallace's theory on the relation between the size of the specimen and the period of development satisfactorily accounted for the fact that as a rule in Lepidoptera the male was smaller than the female. Owing to the precarious tenure of life of a Lepidopterous insect, which was not only exposed to the attacks of many enemies, but was also liable to destruction from mere change of temperature, it was important that the female should be impregnated almost as soon as hatched, and therefore that males should be in readiness at the time of her emergence. The males which first hatched became the parents of the future progeny; the progeny inherited the qualities of the parent; and thus in process of time the males which had a tendency to early hatching, the small specimens which required a shorter period for their development, predominated, while those which hatched later, the larger males, being without mates and therefore leaving no offspring, would constantly tend towards extinction, and finally leave the smaller males in possession of the field.

Mr. Gould exhibited *Hylurgus piniperda*, which was doing considerable mischief to *Pinus insignis* in several parks and plantations in Cornwall.

Mr. Pascoe called attention to an article on *Atropos pulsatoria* in Hardwicke's 'Science Gossip,' of the 1st of February, 1867, in which Mr. W. Chaney wrote as follows:—"My first acquaintance with *Atropos*, or, as it is generally called here, the woodlouse, commenced about thirteen or fourteen years ago: at that time I lived in an old house in Brompton, near Chatham, and in my bed-room, which was also my library and museum, I had a very *olla podrida* of Natural History hanging about the walls; among the rest was a

honey-comb. It was soon after the introduction of this to my list of curiosities that the strange ticking sound (which at the time sorely puzzled me) commenced, and that led me eventually to the investigation of the cause. I soon found that the noise proceeded from the comb, and on closer examination I saw a number of woodlice travelling about from one cell to another, and appearing very busy in their explorations. After awhile the ticking commenced, which I quickly traced to a particular cell, and by the aid of a common convex lens I could perceive *Atropos* beating with its head against the side of the cell, the noise produced being quite as loud as the tick of an ordinary watch, thus confirming Mr. Derham's observations, 'and viewing them with a convex lens, I soon perceived some of them to beat or make a noise with a sudden shake of their body,' &c. From this time the honey-comb, which perhaps from its peculiar sonorous nature suited them so well, became the head-quarters of *Atropos*, and night after night, and sometimes by day, might be heard the tick, tick, tick, by the hour together; sometimes one, sometimes two or more, ticking away with all their might, as if to out-tick each other. At any time, by carefully approaching the comb and waiting a second or two quietly, they might with the aid of a lens be seen at their peculiar pastime. Since then I have lived in my present house, a comparatively new one, for about twelve years, and during that time have constantly heard the familiar tick from time to time, twice during the last week, October 8th and 10th. *Atropos* is very numerous here, seeming to prefer the mantel-piece, upon which are several vases filled with artificial flowers, and any night they may be seen by the dozen prying into any little crevice, or minutely surveying petal after petal of their floral habitation."

February 18, 1867. — Sir John Lubbock, Bart., President, in the chair.

Mr. F. Moore exhibited specimens of *Tomicus monographus*, with portions of the staves of a cask destroyed by this beetle. He added that *T. monographus* was figured in Ratzeburg, but had not hitherto been found in Britain. The casks in question were made of oak, but probably not of British growth.

Mr. Newman exhibited a stem of *Salix capræa*, to show

the mode in which, under the attacks of *Sesia bembeciformis*, the bark divides in three layers. (See Entom. ii. 140).

Mr. Newman exhibited a specimen of *Naclia Ancilla*, *Linn.*, a moth new to Britain, taken on the Sussex coast by Mr. T. Wildman.

Mr. Newman exhibited the lock of a door, one of several which in 1866 were found at the Kent Waterworks, Deptford, to be completely filled and choked up with nests of *Osmia bicornis*, a portion having been forced out by the insertion of the key: the locks were in pretty constant use, so that the whole nest must have been built in the course of a few days.

Mr. Herbert Jenner Fust, jun., communicated a paper "On the Distribution of Lepidoptera in Great Britain and Ireland," showing the occurrence or non-occurrence of all the indigenous species, except the Tortrices and Tineæ, in provinces and sub-provinces, after the manner adopted with respect to plants in Watson's 'Cybele Britannica.'

March 4, 1867. — Frederick Smith, Esq., Vice-President, in the chair.

Mr. A. H. Clarke, of 16, Furnival's Inn, E.C., was balloted for, and elected a Member.

Mr. Bond exhibited specimens of a small Ichneumon, parasitic on the larva of *Dasypolia Templi*, no less than 447 having emerged from a single larva.

March 18, 1867. — Professor Westwood, Vice-President, in the chair.

Dr. A. E. Davies, Royal College of Surgeons, Edinburgh, was elected a Member. M. Barbier-Dickens, 1bis, Rue Paradis Poissonière, was elected a Foreign Member. Mr. F. Archer, 3, Brunswick Street, Liverpool, was elected an Annual Subscriber.

The Chairman announced that the Council had in contemplation the publication of a general Catalogue of British Insects, but so little attention was paid to the Diptera that there would be great difficulty in compiling even an approximately complete list of the indigenous species of that Order. Entomologists throughout the United Kingdom were requested to collect Diptera, noting the times and localities, and to assist the Council in the preparation of the Catalogue.

[These Reports are confined to those portions of the Proceedings relating to British Entomology.]

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Remarks on the Nomenclature of the European Genera of Satyride Lepidoptera. By A. G. BUTLER, Esq., F.Z.S.

I HAVE for some time past been carefully working out the synonymy of the Satyridæ, with a view to making a complete catalogue of that family; and having discovered, by a rigid comparison of all the dates, descriptions and figures, that certain names of species and genera have, for some time, been displacing the original ones, I have been compelled, though of course with great compunction, to attempt to set matters a little to rights.

It seems that if the law of priority, counting from the date of the introduction of the binomial system, is to be strictly observed as the standard by which to fix the name of a species, whether the original title be popular or not, it ought to be accepted by all candid Entomologists as representing "the truth, the whole truth and nothing but the truth."

I am well aware of the fact that some few names have been rejected on the score of their having been published before the appearance of the twelfth edition of the '*Systema Naturæ*;' but since the said names were applied after the *first* introduction of the system, and are undoubtedly true binomial titles, I can see no sufficient reason why they should not be respected, notwithstanding their rejection by Linneus.

The more important corrections which I propose to make are as follows:—

Genus EREBIA, *Dalman* (1816).

Section OREINA, *Westwood* (1840).

1. (Oreina) Epiphron, *Knoch, Beitr.* 3, tab. vi. fig. 1 (1781—83).

nec Cassiope, *Fabricius, Mant. Ins.* Pt. 2, p. 42, N. 417 (1787).

I believe that this is already acknowledged by working Entomologists.

2. (*Oreina*) *Kefersteinii*, *Herrich-Schäffer*, *Eur. Schmett.* i. figs. 617, 618 (1843—45).
Nec *Stubbendorffii*, *Ménétriés* in *Bull. Acad. St. Petersb.* v. p. 262 (1847).
3. (*Oreina*) *Tissiphone*, *Esper*, *Schmett.* i. Pt. 2, tab. cxxii. (1777).
Nec *Cæcilia*, *Hübner*, *Eur. Schmett.* i. pl. 46 (1805).
 The *Cæcilia* of *Esper* is only a variety of *Ceme* of *Esper*.
4. (*Oreina*) *glacialis*, *Esper*, *Schmett.* i. Pt. 2, tab. cxvi. (1777).
Nec *Alecto*, *Hübner*, *Eur. Schmett.* i. pl. 104 (1805).

Section EREBIA true.

5. (*Erebia*) *Maurus*, *Esper*, *Schmett.* i. Pt. 2, tab. cvii. and cx. (1777).
Nec *Melas*, *Herbst*, *Natursyst. Schmett.* viii. p. 191, No. 112, tab. ccx. (1796).
6. (*Erebia*) *Bonellii*, *Hübner*, *Eur. Schmett.* i. pl. 181 (1805).
Nec *Evias*, *Lefebvre*, *Ann. Soc. Linn. Paris*, pl. 10 (1826).
7. (*Erebia*) *Tyndarus*, *Esper*, *Schmett.* i. Pt. 2, tab. lxvii. (1777).
Nec *Dromus*, *Fabricius*, *Ent. Syst.* iii. Pt. 1, p. 224, No. 701 (1793).

Genus HIPPARCHIA, *Fabricius* (1808).

1. (*Hipparchia*) *Fagi*, *Scopoli*, *Ent. Carn.* p. 152, N. 428, fig. 428 (1763).
Nec *Hermione*, *Linnaeus*, *Syst. Nat.* ii. p. 773, N. 149 (1766).
2. (*Hipparchia*) *Marmoræ*, *Hübner*, *Eur. Schmett.* i. pl. 164 (1805).
Nec *Neomiris*, *Godart*, *Enc. Méth.* ix., *Suppl.* p. 827, N. 111 (1819).
3. (*Hipparchia*) *Persephone*, *Hübner*, *Eur. Schmett.* i. pl. 115, pl. 140 (1805).
Nec *Anthe*, *Ochsenheimer*, *Schmett. V. Eur.* i. p. 169 (1807).

Ochsenheimer rejected *Persephone*, as having been used previously by *Fabricius*: I believe that the latter gentleman

described a *Heliconia* as *Persiphone*: I can find no species of *Satyrus* with a similar name.

4. (*Hipparchia*) *Statilinus*, *Hüfnagel*, *Tab. in Berl. Mag.* 2, p. 84, N. 52 (1766).

Nec *Fauna*, *Esper*, *Schmett.* i. Pt. 1, tab. xxix. and lxiii. (1777).

5. *Hipparchia Chiliensis*, *Guérin*, *nec* *Erebia Chiliensis*.

Genus SATYRUS, *Westwood* (1851).

The *Satyrus* of Godart cannot be used, as the type of that genus was *Constantia* of Cramer, a species previously used by Hübner as the type of his genus *Hipio*.

Section MINOIS, *Hübner* (1816).

1. (*Satyrus*) *Dryas*, *Scopoli*, *Ent. Carn.* p. 153, N. 429, fig. 429 (1763).

Nec *Phædra*, *Linnæus*, *Syst. Nat.* ii. p. 773, N. 150 (1766).

Satyrus Alope, *Pegala* and *Hyperantus* (not *Hyperanthus*) must not be separated under the name of *Enodia*, as they are all species of *Minois*: the name *Hyperanthus* was first applied to the *Linnæan* species by *Fuessly* (1775).

Genus EPINEPHELE, *Hübner* (1816).

1. *Epinephele Coctei*, *Guérin*, *nec* *Erebia Coctei*.

This species approaches very near to *E. Janira*, and is exceedingly like the small form described and figured by *Esper* under the name of *Janirula*.

Section XENICA, *Westwood* (1851).

Xenica Abeona and *X. Joanna* will form a section of *Epinephele*, from which they scarcely differ in structure.

Genus ARGE, *Hübner* (1816).

Arge was only used by *Esper* as a specific name, and ought not therefore to form part of the generic synonymy.

1. (*Arge*) *Iapygia*, *Esper*, *Schmett.* i. Pt. 2, tab. cv. (1777).

Nec *Clotho*, *Hübner*, *Eur. Schmett.* i. pl. 42 (1805).

2. (*Arge*) *Syllius*, *Herbst*, *Natursyst. Schmett.* viii. p. 15, tab. 182 (1796).

Nec *Psyche*, *Hübner*, *Eur. Schmett.* i. pl. 44 (1805).

Genus PARARGE, *Hübner* (1816).

1. Pararge *Ægeria*, *nec* *Lasiommata* *Ægeria*.
2. Pararge *Climene*, *Esper* (1777), *nec* *Clymene*, *Fabricius* (1793).

Genus AMECERA, *Butler* (1867).

1. Amecera *Megæra*, *nec* *Lasiommata* *Megæra*.

Genus CÆNONYMPHA, *Hübner* (1816).

1. (Cænonympha) *Geticus*, *Esper*, *Schmett.* i. Pt. 2, tab. cii. and cvii. (1777).

Nec *Ædippus* (*sic*), *Fabricius*, *Mant. Ins.* ii. p. 31, N. 335 (1787).

2. (Cænonympha) *Amyntas*, *Poda*, *Ins. Mus. Græc.* p. 79, N. 52 (1761).

Nec *Iphis*, *Denis*, *Wien. Verz.* p. 321, N. 25 (1775).

3. (Cænonympha) *Arcania*, *Linnæus*, *Fauna Suecica*, ed. 2, p. 273, N. 1045 (1761).

Nec *Ascanius*, *Westwood* in *Gen. Diurn. Lepid.* p. 397, N. 4 (1851).

4. (Cænonympha) *Arcanioides*, *Pierret*, *Ann. Soc. Ent. France*, vi. p. 306 (*Arcanoides*), pl. 12, fig. 5 (1837).

Nec *Ascanioides*, *Westwood*, *op. cit.* N. 5 (1851).

As there appears to be some doubt of the identity of the following with the insect figured by Hübner as *Tullia*, I leave it to be decided by others whether it shall be adopted or not.

- ?? (Cænonympha) *Tullia*, *Müller*, *Faun. Fridr.* p. 36, N. 332 (1764).

Nec *Davus*, *Fabricius*, *Gen. Ins.* p. 259 (1776).

The following species, which have been placed in *Cænonympha*, are referable to other genera.

Papilio *Magus*, *Fabricius*, *Ent. Syst.* iii. Pt. 1, p. 223, N. 700 (1793) = probably a species of *Ypthima*.

Satyrus *Dorycus*, *Cyamites*, *Mehadeva*, *Manipa*, *Shiva* and *Sirius* appear to be all species of *Mycalesis*.

Papilio *Irius* will go with *Cænonympha* *Euphemia* into the genus *Hypocista*.

I think it very likely that some of the latter species have been already placed in their respective genera.

It will have been noticed in the present paper that I propose to alter the names of several British species of Satyridæ: now, as I hear rumours of a List of British Insects, would it not be well that at least the synonymy of the remainder of the butterflies should be carefully looked into? It is a fact beyond dispute that British butterflies are rarely referred, by English Entomologists, to their proper genera: I am constantly seeing the following in print:—

Anthocharis Cardamines	for Euehlœ Cardamines
Vanessa Atalanta	„ Pyrameis Atalanta
Cynthia Cardui	„ Pyrameis Cardui
Grapta C-Album	„ Vanessa C-Album

The genus Euehlœ was first described by Hübner (1816). It is absurd to separate Atalanta generically from Cardui, as many intermediate forms exist; it is, however, quite distinct from Vanessa. C-Album is closely allied to Polychloros, and is linked to that form by several connecting species. Cardui has nothing whatever to do with the genus Cynthia.

It appears to me that we have at least two genera under the name of Thecla, but I have not yet paid much attention to this group.

A. G. BUTLER.

A Revision of the British Species of the Genus Bombus.

By FREDERICK SMITH, Esq.

(Continued from p. 269).

7. *Bombus Pomorum*, *Smith, Ent. Ann.* (1865), p. 85, male, female.

Bremus Pomorum, *Panz. Faun. Germ.* 89, 17, male.

Some years ago I captured three male *Bombi* which I subsequently regarded as extremely fine varieties of the male of *Apathus rupestris*; at that time I did not very carefully examine them. In 1864 my son captured a female *Bombus* that was new to me: this was taken about two miles distant from the locality where I had previously found the three males. The close resemblance between these males and the

female induced me to examine all the specimens with greater attention: the males proved to be those of a true *Bombus*, exactly agreeing with Panzer's figure and description; I therefore have adopted his name for the species. I am aware that hymenopterists have hitherto considered Panzer's insect to be a male *Apathus*; my own capture induces me to hold a different opinion, and I am averse to encumbering the genus with new names. I have not been able to capture the species since the date given, although I have diligently searched for it at its former localities, Walmer and Deal sand-hills.

8. *Bombus Derhamellus*, *Illig. Mag.* v. 169; *Dahlb. Bomb. Scand.* No. 33; *Drews. & Schiödte, Bomb. Denm.* p. 151; *Smith, Bees Great Brit.* p. 219; *Nyl. Ap. Boreal.* p. 238.

Apis Derhamellus, *Kirby, Mon. Ap. Angl.* ii. 363, male.
A. Raiellus, *Id.* 367, female, male.

Bombus Raiellus, *Schenck, Hym. Nassau*, p. 153.

Found in all parts of the country, but I think much more common in the north than the south: its nests are not uncommonly found on banks, also in hay-fields: its communities are small. It makes no defence when its nest is disturbed.

9. *Bombus Pratorum*, *Illig. Mag.* v. 168; *Dahlb. Bomb. Scand.* No. 36; *Drews. & Schiödte, Bomb. Denm.* p. 111; *Smith, Bees Great Brit.* p. 220; *Nyland. Ap. Boreal.* p. 237; *Schenck, Hym. Nassau*, p. 155.

Apis Pratorum, *Linn. Faun. Suec.* No. 1711, neuter;
Kirby, Mon. Ap. Angl. ii. 356, female, neuter.

A. subinterrupta, *Kirby, Mon. Ap. Angl.* ii. 356, female.

A. Burrellana, *Id.*, 358, male.

Bombus subinterruptus, *Dahlb. Bomb. Scand.* No. 43, female; *St. Farg. Hym.* i. 461.

B. Burrellanus and *B. ephippinne*, *Dahlb. Bomb. Scand.* 43 & 37.

Bombus lullianus, *Nyland. Ap. Boreal.* 236, male.

Linneus' typical specimen still exists in the cabinet of the Linnean Society; it is a worker bee. The nests of this species are plentiful, so that the sexes are now well known.

In 1837 Mr. Walcott, of Clifton, Bristol, communicated the following:—"A very interesting nest of *Bombus Pratorum* was found the other day; it was in a robin's nest containing several eggs: the humble bee had so discomfited the poor bird, by building its combs between the eggs, that she deserted it. I have, in two instances, found broods of *B. Derhamellus* in birds' nests."

10. *Bombus Cullumanus*, *Smith, Zool.* ii. 548, male.

Apis Cullumana, *Kirby, Mon. Ap. Angl.* ii. 359, male.

A. Donovanella, *Id.* 357, female.

In my work on the 'Bees of Great Britain' I have given this species as synonymous with *B. Soroensis*: M. Schiödte held that opinion, and it was not until I obtained a numerous supply of specimens, and was able to decide the point by an examination of the organs of generation, that I detected my error. I am not certain that *B. Donovanella* is the true female, but I took examples in the same locality as the male. The species has been taken by Mr. Walcott near Bristol, and by Mr. Unwin near Lewes. In M. Drewsen's collection there are specimens of the male, which he also considers distinct from that of "*Soroensis*," a species very abundant near Copenhagen.

11. *Bombus nivalis*, *Dahlb. Bomb. Scand.* No. 40; *Zett.*

Ins. Lapp. 474; *Nyland. Ap. Boreal. Revis.* 262;

Smith, Bees Great Brit. p. 222.

Apis alpina, *Fabr. (Otho) Faun. Græn.* p. 199 (*nec* Linn.)

Bombus balticus and *B. tricolor*, *Dahlb. Bomb. Scand.*

36 & 40? *Zett. Ins. Lapp.* p. 474.

This species has not been found anywhere in this country, except in Shetland, from whence it was first sent by Mr. John White; subsequently Mr. Squire took it near Lerwick.

12. *Bombus Scrimshirani*, *Illig. Mag.* v. 166; *Dahlb.*

Bomb. Scand. No. 39; *Drews. & Schiödte, Bomb.*

Denm. ii. 118; *Smith, Bees Great Brit.* p. 222;

Nyland. Ap. Boreal. 232.

Apis Scrimshirana, *Kirby, Mon. Ap. Angl.* ii. 338, female, male.

A. Jonella, *Id.*, male.

This is a very local species, but is widely distributed: I have only taken it in three localities—some years ago on

the high ground beyond Coomb Wood ; on Purley Downs ; and on the 3rd of July, 1864, I took it rather plentifully on Shirley Common ; but I have only found females. Some years ago the collector, J. Foxcroft, found a nest, containing all the sexes, at Loch Rannoch, in Perthshire ; the nest was under a stone and composed of moss. The *Apis Jonella* has proved a difficulty to Entomologists, the description being incomplete : this was rectified by Mr. Kirby in his own interleaved copy of the work which was obligingly lent to me by his nephew ; to the description in the work was, in manuscript, "*Facies ante antennis pallide villosus :*" this at once completes the description of the male of *Bombus Scrimshiranus*.

13. *Bombus Soroensis*, *Illig. Mag.* v. 167 ; *Fabr. Syst. Piez.* p. 345, female ; *Dahlb. Bomb. Scand.* 43 ; *Drews. & Schiödte, Bomb. Denm.* ii. 112 ; *Nyland. Ap. Boreal.* 239.

Apis neutra, *Panz. Faun. Germ.* 83, 18, neuter.

Bombus neutra, *Fabr. Syst. Piez.* p. 347 ; *St. Farg. Hym.* i. 469.

Bremus Sylvarum, *Panz. Faun. Germ.* 85, 19 (*nec* Linn.)

Bombus collinus, *Smith, Bees Great Brit.* p. 223.

This must be one of the most local species of the genus : in August, 1854, I took the insect at Southend, since which I have not met with it ; the Rev. Mr. Rudd took it at Yarm, in Yorkshire, and Mr. Heysham took the male in abundance near Carlisle ; Mr. Walcott has specimens from the Brighton Downs, and has also taken it in the vicinity of Bristol ; but I have only seen one or two British examples of the female. The dark variety of *Bombus subterraneus* has been mistaken for this species by many hymenopterists : such was my own opinion until M. Drewsen sent me the true species from Copenhagen, where the typical specimen of Fabricius is to be found in the Museum : it is much smaller than "*subterraneus*," not quite so large as *B. hortorum* : the female is about eight lines long, is black, with apical portion of the abdomen white ; the two colours are divided by a rosy band.

In 1856 a female of this species was taken by Mr. Geo. Edwards at Hampstead.

14. *Bombus lapidarius*, *Latr. Hist. Nat. Ins.* xiv. 62, female; *Illig. Mag.* v. 169; *Fabr. Syst. Piez.* p. 347; *Dahlb. & Schiodte, Bomb. Denm.* ii. 116; *Westw. Nat. Libr.* xxxviii. 252, male, female; *Smith, Bees Great Brit.* p. 228; *Nyland. Ap. Boreal.* 238; *Schenck, Hym. Nassau*, p. 150.

Apis lapidarius, *Linn. Faun. Suec.* p. 424; *Syst. Nat.* i. 960; *Kirby, Mon. Ap. Angl.* ii. 339; *Scop. Ent. Carn.* p. 305; *Schrank, Ins. Aust.* p. 396; *Don. Eng. Ins.* iii. 97.

Apis arbustorum, *Fabr. Ent. Syst.* ii. 320, male.

Bremus truncorum, *Panz. Faun. Germ.* 86, 17, male.

Bombus Lefebvrei, *St. Farg. Hym.* i. 461 (*var. female*).

One of the most generally distributed and abundant species of the genus: it has its representative in India, China, Japan and Mexico; indeed it is difficult to point out the specific differences between them. I once saw a specimen of the beautiful variety, *B. Lefebvrei*, in the possession of Mr. Wing, taken near Sandwich, in Kent: the variety differs in having a yellow collar, and it is remarkable that the parasite of *B. lapidarius*, *Apathus rupestris*, sometimes exhibits a similar variation in colouring: I never saw a British example, but have it from the Continent. The nest of this species is frequently found under stones; in old stone-quarries in Yorkshire I have repeatedly found it; but it also occurs in banks, frequently at the roots of trees: it defends its nest with great courage and perseverance.

15. *Bombus terrestris*, *Smith, Bees Great Brit.* p. 224; *Nyland. Revis. Ap. Boreal.* p. 262; *Westw. Nat. Libr.* xxxviii. p. 243.

Apis terrestris, *Kirby, Mon. Ap. Angl.* ii. 350, female.

Var. γ., female, and *ε.*, female. *Var. β.*, neuter.

I forwarded specimens of this species to Denmark and Sweden: Dahlbom, Schiödte and Boheman all told me that the insect was not found in Sweden or Denmark, and all named the female of *B. Lucorum* the Linnean *Apis terrestris*: this information has long been published, notwithstanding which Mr. Shuckard, in his recent work, repeats the error into which so many have been led. Some hymenopterists have thought the species "*terrestris*" and "*Lucorum*" were mere varieties of one insect: this I am satisfied is erroneous,

having taken nests of both, and obtained all the sexes from them. If the males of each are compared, it will be at once apparent that they are perfectly distinct; it is only necessary to compare the shape of the head in the two species to at once perceive the distinction, independent of difference of the colour of the pubescence with which they are clothed; but the most conclusive, and perhaps the most satisfactory, proof is to be obtained by a comparison of the organs of generation.

A few years ago I took three specimens of this species with pure white hair on the apical portion of the abdomen: this variety occurred at Pakefield, in Suffolk. Mr. Kirby has described three females; that of the full description has a white tip to the abdomen; his var. γ . and δ . are both females, having a tawny apex.

16. *Bombus Lucorum*, *Illig. Mag.* v. 166; *Fabr. Syst. Piez.* p. 350, male; *Smith, Bees Great Brit.* p. 225, male, female, neuter; *Nyland. Revis. Ap. Boreal.* 262.

Apis Lucorum, *Linn. Faun. Suec.* p. 427, male; *Fabr. Ent. Syst.* ii. 322, male; *Kirby, Mon. Ap. Angl.* v. 336, male.

A. terrestris, *Linn. Faun. Suec.* 424, female.

A. Cæspitum, *Panz. Faun. Germ.* 31, 19, male.

Bombus sporadicus, *Nyl. Ap. Boreal.* 232.

B. Ericetorum, *Curtis, Brit. Ent.* xii. fol. 564, male.

This species is extremely abundant, and is found in all parts of the country; it is also found throughout Europe. Specimens of the female from Greece and Spain frequently have the corbicula on the posterior tibiæ yellow: I have taken the same variety in Suffolk. The colouring of the male is very variable, the black band on the thorax and also that on the abdomen being almost entirely replaced by yellow pubescence.

17. *Bombus Hortorum*, *Latr. Hist. Nat.* xiv. 65, female; *Illig. Mag.* v. 4; *Fabr. Syst. Piez.* p. 347; *Dahlb. Bomb. Scand.* 38; *St. Farg. Hym.* i. 466; *Brullé, Expéd. Morée*, iii. 328; *Drechs. & Schiödte, Bomb. Denm.* ii. 120; *Smith, Bees Great Brit.* p. 230; *Nyland. Ap. Boreal.* p. 231; *Schenck, Hym. Nassau*, p. 150.

Perhaps this is the most widely distributed species in the genus: it is found throughout Europe, and Dr. Richardson took it at Lake Winnepeg, in the arctic regions.

18. *Bombus Latreillellus*, *Illig. Mag.* v. 164, male; *Dahlb. Bomb. Scand.* p. 39, male; *Drews. & Schiödte, Bomb. Denm.* ii. 120, male, *Nyland. Ap. Boreal.* p. 261; *Smith, Bees Great Brit.* p. 231, male, female, neuter.

B. Tunstallanas, *Kirby, Mon. Ap. Angl.* ii. 346, female.

B. Tunstallanus, *Drews. & Schiödte, Bomb. Denm.* 119, female; *Schenck, Hym. Nassau*, p. 150.

The female described by Mr. Kirby, and also the var. β ., are specimens of *B. subterraneus*; the var. γ . is a female of *B. Latreillellus*, and all the other varieties belong to the same species. This *Bombus* may always be distinguished, that is the female and worker, by the shortness of the pubescence on the abdomen, and by the margins of the first and second segments being thinly and somewhat indistinctly fringed with pale hairs. I have during the past season taken all the sexes from the nest: it builds underground; usually its nest is approached by a tunnel a yard or even more in length: it is very abundant at Walmer, in Kent: its nests are usually found in banks. The *Apathus vestalis* is parasitic upon it.

19. *Bombus subterraneus*, *Fabr. Syst. Piez.* p. 350, 39, female; *Dahlb. Bomb. Scand.* p. 38; *Drews. & Schiödte, Bomb. Denm.* 116; *Nyland. Ap. Boreal.* female, p. 239; *Smith, Bees Great Brit.* p. 233, female, neuter, male; *Schenck, Hym. Nassau*, p. 153.

Apis subterranea, *Linn. Faun. Suec.* p. 425; *Syst. Nat.* i. 961, female; *Fabr. Ent. Syst.* ii. 322.

A. Harrisella, *Kirby, Mon. Ap. Angl.* ii. 373, female, male.

A. Soroensis, *Id.*, ii. 354, female, neuter (*nec* Fabr.)

Bombus Harrisellus, *Westw. Nat. Libr.* xxxviii. 256; *Smith, Zool.* ii. 550.

B. Soroensis, *St. Farg. Hym.* i. 468 (*nec* Fabr.)

B. flavo-nigrescens, *Smith, Zool.* iv. 1556.

All the sexes vary from gaily banded insects to totally black, and a considerable degree of observation and practice

is required before anyone can become familiar with all the forms of this Protean species. I do not myself feel quite certain that I am not confounding two species in the synonymy I have given. It is the opinion of a practical and accomplished Entomologist, Mr. Walcott, of Bristol, that *B. Harrisellus* is distinct, a species always black; but, notwithstanding, I am quite satisfied that *B. subterraneus* varies from a bright banded form to one quite black; and I have a specimen of *B. Harrisellus* that was taken *in coitu* with a banded male; and that species sometimes intermingle I am certain, having taken a male of *B. lapidarius* thus circumstanced with a female of *B. terrestris*: this is the solitary instance I have observed. *B. subterraneus* is very abundant in many localities, as is also *B. Harrisellus*; yet no one has yet found a nest of the latter insect, or variety, in which all the sexes were black. Future observation may probably prove the necessity of their separation.

FREDERICK SMITH.

(To be continued).

Entomological Notes and Captures.

Varieties of Lepidoptera. — Enclosed I send figures of varieties of *Lycæna Corydon* (female) and *Satyrus Hyperanthus*, both captured in this neighbourhood. I should be obliged if you could give me the names. If you would like to figure them, or either of them, for your work on *Lepidoptera*, I shall have much pleasure in forwarding the originals. There are several varieties of *S. Hyperanthus* in the British Museum collection, but I think they all differ from mine. The fore wings are quite immaculate on the upper side, and the hind wings very nearly so, the spots being very indistinct. Of the variety of *Lycæna Corydon* I have never seen another specimen. — *A. G. Hudd*; 1, *Gloucester Row, Clifton, May 11, 1867.*

[I am much obliged for these interesting drawings, but cannot name them; indeed I see little advantage in naming accidental deviations from the ordinary colouring.—*E. N.*]

Deilephila lineata at *Ventnor*. — I captured a fine specimen of *D. lineata*: it came in the Institution a few minutes to ten o'clock at night. No doubt the gas-light brought it

in. I have not heard of one being taken since 1859; then I had two brought me. — *I. Keet*; 2, *Shute Cottage, Ventnor, Isle of Wight, May 11, 1867.*

Deilephila lineata at *Brighton*.—On the 15th of May the above was found at rest on the bricks in the yard of Milton House, Jubilee Street, Brighton, and was brought to me alive and in very fair condition. About the middle of May, 1860, three were found here in different parts of the town. Is it not a very unusual time for their appearance?—*Thomas Thornecroft; North Road, Brighton.*

[I think not: Mrs. King captured a specimen on the same day at Sudbury.—*Edward Newman.*]

Sterrha sacraria in the *Isle of Wight*.—I send you by this post a small box, containing a moth which I took on the 7th of May, in a clover field. I fancy it is *Sterrha sacraria*: I send it to know if I am right in this conjecture. One point I wish to draw your attention to, namely, that in all the woodcuts I have seen of the insect the stripe is *right across* the wing, whereas in this specimen it does not reach the inner margin. In flight it resembled *Aspilates citraria*, of which I thought perhaps it was an early specimen; but as soon as I saw the plain ground colour and the oblique stripe it struck me at once that it answered, or nearly so, the description of the scarcer geometer. I had some difficulty in boxing it, but at last got it, and brought it home in good order. Please say if the name is right, and whether you think it had lately come out or hybernated. If it is the insect and a spring specimen, this will seem to argue that there are two broods, as I think all our recorded specimens have been taken in autumn.—*J. Pristo; Whippingham, May 13, 1867.*

[The insect is certainly *Sterrha sacraria*, and in such beautiful condition that I cannot doubt its having been recently disclosed, thus strengthening Mr. Pristo's belief that the species is double-brooded.—*Edward Newman.*]

Proceedings of the Entomological Society of London.

April 1, 1867.—Sir John Lubbock, Bart., President, in the chair.

Mr. Smith exhibited an *Ichneumon*, *Rhyssa persuasoria*,

placed in his hands by Mr. Bond, which appeared to have worked its long ovipositor, bradawl-fashion, through a piece of fir-wood, in quest of the larva of *Sirex juvencus*, on which it is parasitic; part of the ovipositor had been left in the wood. Mr. Bond had some years ago found at Bournemouth two *Ichneumons* with their ovipositors so firmly fixed into wood that he was unable to remove them. Mr. Smith had always hitherto supposed that the *Rhyssa* inserted its ovipositor into the holes made by the *Sirex*, instead of making a hole for itself in the tree: if the latter were the rule, how did the *Ichneumon* detect the presence of the larva within the wood, and know where to insert its ovipositor? Mr. Edward Doubleday, however, had told him that he had seen twenty or thirty specimens of the female of a *Pelecinus* which had perished with their elongated abdomens inserted into the stem of a tree, whence they had been powerless to extract them; the male had a clavate abdomen, but that sex had never been met with by Mr. Doubleday.

Mr. Bates inquired whether an ovipositor was not, homologically, a modification of one of the abdominal segments.

Mr. Smith thought it was rather a modification of the aculeus.

Mr. Wallace suggested the converse, namely, that the sting was a modified ovipositor, and that its use as a weapon of defence was a secondary and acquired use.

Mr. G. S. Saunders exhibited a number of *Poduridæ* found near Stokesley, in pools or puddles consequent upon the melting of the snow, which had recently lain on the ground in the North of Yorkshire for two or three weeks.

The President believed them to be *Podura* (*Anura*) *tuberculata* of Templeton, though their shrivelled state rendered them difficult to identify with certainty.

Mr. Wallace mentioned that he had received a letter from Mr. Jackson Gilbanks, of Whitefield Castle, Wigton, on the subject of the distastefulness to birds of brightly coloured larvæ: the writer had frequently observed the dislike, or rather the "abhorrence and dread," of pheasants, partridges, young wild ducks and tomtits for the "gooseberry caterpillar;" it did not, however, clearly appear whether the writer referred to the larva of *Abraxas* or the grub of *Nematus*.

THE ENTOMOLOGIST.

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JULY, MDCCCLXVII.

[PRICE 6D.

Notes on the Nomenclature of the European Satyridæ, &c.

By W. F. KIRBY, Esq., Assistant in the Museum of the Royal Dublin Society.

HAVING devoted some attention to an article in the June number of the 'Entomologist,' entitled "Remarks on the Nomenclature of the European Genera of Satyride Lepidoptera," by Mr. A. G. Butler, a few words on the application of the law of priority, with special reference to some points therein noticed, may not be out of place. The 'Rules for Zoological Nomenclature,' published by the British Association, being the standard usually acknowledged by naturalists, I propose to test Mr. Butler's alterations by these.

Erebia Epiphron, *Knoch*. — This name, as noted by Mr. Butler, must stand in place of *E. Cassiope*, *Fabr.*, if the two insects are only varieties of the same species. This alteration, as well as the substitution of *E. Medea*, *W. V.*, for *E. blandina*, *Fabr.*, has already been sanctioned by Mr. Doubleday, in his Supplementary List of British Lepidoptera.

E. Stubbendorffii, *Ménétr.* — This name must be dropped in favour of *E. Theano*, *Tauscher*. It is not identical with *E. Kefersteinii*, *Eversm. Moscow Bulletin*, 1851. I have not had an opportunity of consulting Herrich-Schäffer's figures, 617, 618, and therefore cannot say if they refer to Eversmann's species (as Staudinger states) or not. I suspect, however, that they are of very recent date.

E. Tisiphone, *Esp.*, and *E. glacialis*, *Esp.* — Both these forms are noted by Staudinger as varieties of *E. Alecto*, *Hüb.*

Hipparchia Hermione, *Linn.* — Without entering into the question whether the twelfth edition of the 'Systema Naturæ' is to be taken as the earliest standard of nomenclature, as recommended by the British Association, we are still fully justified in rejecting Scopoli's wholly forgotten name (*H.*

Fagi), on account of its being inappropriate, as the larva feeds on grass, like almost every other species of the family Satyridæ. It is surely not desirable to attempt to revive a wholly inappropriate name, which might lawfully be changed if its claim to priority were undoubted, especially as it has never been current since its publication in the middle of the last century.

Satyrus Hyperanthus, *Linn.*, and Lasioommata Clymene, *Esp.*—In accordance with an admitted rule, the former incorrect spelling of these names has been corrected by subsequent authors, the names of the original authorities being still attached to the species. There is therefore no reason for reviving obvious and obsolete errors of this kind, especially as no object is to be gained by it. Some of these are doubtless mere misprints.

Genus Arge, *Hübner*, *Boisd.*—This name is objected to by Mr. Butler, on the ground of its being based on the mischievous principle of changing a specific into a generic name. Staudinger wisely adopts Meigen's name, Melanagria, which he states to be three years prior to Boisduval's.

The genera in Hübner's 'Verzeichniss der bekaunter Schmetterlinge' are universally admitted, independently of their excessive number, to be so badly defined as to be worthless, when not fully characterized by a subsequent authority. Hence it is that Boisduval's genera are usually received instead. Anthocharis, for example, is preferred by most Entomologists to Euchlœe. Guenée's name, Chortobius, has, however, no claim to supersede Cœnonympha, *Hübner*, *Westw.* Still less ought Guenée's name to be attached indiscriminately to every family of Lepidoptera.

The genus Cynthia, *Fabr.*, was extremely heterogeneous; but the type-species, C. Arsinoe, *Cram.*, as remarked by Mr. Butler, has no connexion with the genera Pyrameis, *Hübner*, *Doubl.*, and Vanessa, *Fabr.* The two latter genera are, however, much more closely allied than Cynthia is with either of them. Whether the genus Grapta, *Kirb.*, should stand or not, I will not attempt to decide. Genera being in many cases artificial, it frequently becomes a mere matter of taste or convenience whether they should be adopted or not. Their needless multiplication is not desirable, though it would be well if such large genera as Papilio or Pieris could be satisfactorily subdivided.

Mr. Hewitson, in his 'Catalogue of Lycænidæ,' removes *Thecla Betulæ* and *T. Quercus* to the genus *Dipsas*, *Doubl.*

W. F. KIRBY.

A Revision of the British Species of the Genus Bombus.

By FREDERICK SMITH, Esq.

(Continued from p. 288).

Genus *APATHUS*, *Newm.*

Of this genus four species are found in this country; they are the well-known parasites of the genus *Bombus*: so closely indeed do they resemble the latter insects that, until Mr. Kirby subjected them to the same critical anatomical investigation which he bestowed upon the rest of our native *Apidæ*, it is almost certain that no one ever detected any difference in the habits of these bees. Mr. Kirby says, "After my 'Synopsis' was printed I discovered, what had escaped me before, that four species were deprived of some of the characters of the *Bombinatrices*, having neither corbícula nor pecten at the apex of the tibiæ, nor auricle at the base of the plantæ of the posterior legs:" he does not appear to have suspected their parasitism, for he adds, "I suspect they nidificate under ground," and that he did not is, I think, proved by his supposing them to have neuters.

I have not been able to discover who it was that first indicated this habit, or first discovered them in the nests of the *Bombi*. I have myself found *Apathus vestalis* in the nests of *B. terrestris*, *B. Lucorum* and *B. Latreillellus*. *Apathus campestris* I have seen entering the nest of *B. Hortorum*. *Apathus Barbutellus* was bred by Mr. Walcott from a nest of *B. Pratorum*, and I have observed *A. rupestris* issuing from a nest of *B. lapidarius*: by watching I captured several females making their exit. *B. Muscorum*, *senilis*, *fragens* and *Sylvarum* do not appear to be subject to their attacks; I have taken many nests of these species without ever finding a single parasite: the species that build under ground are certainly most subject to their parasitism.

The fact of the *Apathi* never, apparently, entering the nests of some species, proves that their presence in no way

conduces to any necessary purpose in carrying out the details of any portion of the economy of the Bombi; but it is, I think, quite probable that, in those nests where they locate themselves, they may take part in the domestic arrangements of the nest, feeding the young brood, or taking a part in the construction of cells for their reception: these are mere conjectures, and we are aware that an ample field is open to further investigation. I have only twice detected the sexes of *Apathi in coitu*,—on one occasion *A. rupestris* and on another *A. vestalis*. These bees appear to be most abundant in northern latitudes; not one has been found in India or China, and only one in Brazil. Four species are known from North America and one from Mexico.

The black varieties of the male and female of *Apathus campestris* are regarded by some hymenopterists as forming a distinct species, but I cannot agree in this opinion. In a fine series of the males every shade of approach to blackness is found: the female in her black livery is very rarely met with; I have only taken it twice myself, and have only seen two or three captured by other Entomologists.

It has been recently stated that there are two broods of *Apathi* in the year; my own opinion, based upon a close investigation of the Bombi during a period of thirty years, is that there is only one. In the spring we see the female *Apathi* of the previous year appear, but rather later than the females of the Bombi; but after a short period they almost, if not entirely, disappear: about the beginning of autumn the male *Apathi* come forth in much greater abundance than we ever see the females, which do not leave the nest until a few weeks later than the males.

1. *Apathus rupestris*, *Smith, Bees Great Brit.* p. 234, male, female.

Apis Albinella, *Kirby, Mon. Ap. Angl.* ii. 361, male.

A. rupestris, *Fabr. Ent. Syst.* ii. 320, female; *Kirby, Mon. Ap. Angl.* ii. 369.

Bombus rupestris, *Fabr. Syst. Piez.* p. 348, female.

Psithyrus rupestris, *St. Farg. Hym.* ii. 426; *Drews. & Schiödt, Bomb. Denm.* 125; *Curtis, Brit. Ent.* x. fol. 468; *Nyland. Ap. Boreal.* 241; *Schenck, Hym. Nassau*, p. 159.

There is a variety of the female with a yellow collar, rarely

found on the Continent, but I am not aware of its having been observed in this country. This insect is usually taken sparingly, but on one or two occasions I have taken it plentifully, once at Coomb Wood, Surrey, and also at Kingsdown, near Deal; also near Lowestoft, in Suffolk.

2. *Apathus vestalis*, *Smith, Bees Great Brit.* p. 238, male, female.

Apis vestalis, *Kirby, Mon. Ap. Angl.* ii. 347, female.

Bremus æstivalis, *Panz. Faun. Germ.* 89, 16, female.

Bombus vestalis, *Dahlb. Bomb. Scand.* No. 34.

Psithyrus vestalis, *St. Farg. Hym.* ii. 430.

P. æstivalis, *Drews. & Schiödte, Bomb. Denm.* 123, female; *Nyland. Ap. Boreal.* p. 241.

P. Rossiellus, *Drews. & Schiödte, Bomb. Denm.* 123, male; *Nyland. Ap. Boreal.* p. 242; *Schenck, Hym. Nassau*, p. 164.

Probably the most abundant species of the genus: the males are occasionally found in great numbers on thistle-heads.

3. *Apathus campestris*, *Smith, Bees Great Brit.* p. 235, male, female.

Apis campestris, *Panz. Faun. Germ.* 74, 11, female; *Kirby, Mon. Ap. Angl.* ii. 335, female.

A. Rossiella, *Kirby, Mon. Ap. Angl.* ii. 331, male.

A. Francisana, *Id.*, 334, male.

A. subterranea, *Id.*, 371; male.

Bombus campestris, *Fabr. Syst. Piez.* p. 344, female; *Dahlb. Bomb. Scand.* p. 51.

B. Rossiellus, *Dahlb. Bomb. Scand.* p. 40, male.

Psithyrus Rossiellus, *Drews. & Schiödte, Bomb. Denm.* 123.

P. campestris, *St. Farg. Hym.* ii. 433, female; *Drews. & Schiödte, Bomb. Denm.* 123; *Schenck, Hym. Nassau*, p. 163.

P. Francisanus, *Drews. & Schiödte, Bomb. Denm.* 125, male; *Nyland. Ap. Boreal.* p. 241.

The most variable species of the genus: the male varies from a highly coloured form to totally black; the female is subject to a similar variety in coloration.

4. *Apathus Barbutellus*, *Smith, Bees Great Brit.* p. 237, male, female.

Apis Barbutella, Kirby, *Mon. Ap. Angl.* ii. 343.

Psithyrus quadricolor, St. Farg. *Hym.* ii. 428, male.

P. Barbutellus, Schenck; *Hym. Nassau*, p. 163.

A very abundant species in all parts of the country : it has been found in the nests of *Bombus Pratorum* and of *B. Derhamellus*.

Fam. ANDRENIDÆ, Leach.

Section I. OBTUSILINGUES, Westw.

Genus COLLETES, Latr.

The economy of this genus of bees has been repeatedly detailed. Mr. Kirby has quoted from Réaumur an interesting fact of their nests having been found in the interstices of an old wall, a situation in which I myself have never found them; he also quotes from Grew's 'Rarities' an account of their having formed burrows in the pith of an old elder-branch. These can only be regarded as instances of deviation from their usual habit. I have repeatedly found the nests of three of the species, *C. marginata* being the only one I never traced to its burrows. They are gregarious in their habits, and occasionally form extensive colonies, usually, as I have observed, in banks having a south or south-western aspect. It is a mistake on the part of the author of the recent work on the 'British Bees' to state that "the aspect selected by the females for their burrows varies according to the species:" the three species whose burrows I have frequently examined, and from the cocoons obtained from which I have bred the insects, all select warm sunny aspects, never a northern one. Neither do I agree with the same author in his statement that they have "two broods in the year:" the brood which is observed burrowing lays up a store of food for one which is not to appear until the following spring, having passed the winter in the larva state: pupæ, or perfect bees, are never found until the spring has far advanced, or in early summer.

C. fodiens and *C. marginata* I have taken on the flowers of the ragwort; *C. succincta* I never saw frequenting any flower except the common heath (*Calluna vulgaris*), and *C. Daviesana* frequents the wild tansy (*Tanacetum vulgare*). The only parasites that I have reared from this genus of bees are

the pretty little bee, *Epeolus variegatus*, and the dipterous species, *Miltogramma punctata*; the former from the cells of *C. Daviesana*, the latter from the same species and also from *C. fodiens*.

In a burrow of *Colletes succincta* I once found a very small specimen of *Meloe brevicollis*, its length being three lines. In the month of September, 1846, I found a colony of this bee, and, being desirous of breeding the species, I dug into the bank: in one burrow I discovered four cells, three containing each a larva of the bee, and in one cell a very immature *Meloe*, which did not assume its proper colouring until the month of March following. This solitary instance scarcely establishes its parasitism on this species of bee, particularly when we take into consideration the diminutive size of the *Meloe*: I can only regard it as an accidental occurrence. The beetle is one of great rarity: I have repeatedly searched the same locality for it subsequently, but never again met with it.

1. *Colletes succincta*, *Smith, Bees Great Brit.* p. 3; *Schenck, Hym. Nassau*, p. 300.

Apis succincta, *Linn. Syst. Nat.* i. 955.

Andrena succincta, *Fabr. Syst. Ent.* p. 378; *Rossi, Faun. Etrus.* ii. 98.

Apis Calendarum, *Panz. Faun. Germ.* 83

Melitta succincta, *Kirby, Mon. Ap. Angl.* ii. 32.

Hylæus glutinosus, *Latr. Cuv. R. Anim.* iii. 513.

Evodia Calendarum, *Panz. Krit. Revis.* p. 208.

Colletes fodiens, *Curtis, Brit. Ent.* ii. fol. 85; *Nyland. Ap. Boreal.* 206.

This species has been found plentifully at Weybridge; also at Arundel, Lowestoft, Isle of Wight, Bournemouth, Land's End, and in Killarney: it is a generally distributed species.

2. *Colletes fodiens*, *Smith, Bees Great Brit.* p. 4; *St. Farg. Hym.* ii. 298; *Lucas, Explo. Sc. Algér.* iv. 182; *Schenck, Hym. Nassau*, p. 299.

Melitta fodiens, *Kirby, Mon. Ap. Angl.* ii. 34.

This species I have never found in large colonies, but it appears to be widely distributed: I have found it in Kent, Surrey, Hampshire and Suffolk, and Mr. Wollaston found it at Killarney, but I have not seen any specimens from the North of England.

3. *Colletes marginata*, *Smith, Bees Great Brit.* p. 5 ;
Schenck, Hym. Nassau, p. 300.

Apis marginata, *Linn. MSS. in Linnean Cabinet*, male.

Colletes succincta, *Nyland. Ap. Boreal.* 206.

This is the smallest species of the genus found in this country : it is extremely rare, and was discovered by Mr. S. Stevens at Little Hampton ; I subsequently met with it, in 1846, at Deal, on the western side of the sand-hills ; since that time I have not taken it.

4. *Colletes Daviesana*, *Smith, Bees Great Brit.* p. 6 ;
Schenck, Hym. Nassau, p. 300.

Melitta Daviesana, *Kirby's MSS., interleaved copy of Mon. Ap. Angl.*

The most abundant species of the genus in the South of England : very large colonies occur in Kent and Surrey, in hard compact sand-banks : it is plentiful in Whitesand Bay, at the Land's End, and I have taken it in Yorkshire.

The males of this genus of bees are somewhat difficult to separate ; that of *C. marginata* is the smallest, that of *C. succincta* the largest. The male of *C. fodiens* has the abdomen very closely punctured and semi-opaque. The male of *C. Daviesana* may be known by its having the fasciæ on the margins of the abdominal segments continued beneath, curving inwardly, but not uniting in the middle.

FREDERICK SMITH.

(To be continued).

Entomological Notes and Captures.

Pterophorus Hieracii, Zel. — The larvæ of the insect we have in our collections as *P. Hieracii* have at last been discovered simultaneously by Mr. Greening, at Delamere Forest, and by myself, at Pant Moen and at Pen-y-Garrowin, in North Wales, feeding upon *Teucrium Scorodonia* ; and we shall now be able to ascertain what difference, if any, exists between the larvæ of our insect and Zeller's *P. Hieracii*, which is said to feed on *Hieracium umbellatum*, in June. We took our larvæ at the end of April, and now (May 19th) many of them are nearly full-fed. I must say I never could reconcile the Delamere and Welsh specimens with some

I have had sent to me by kind friends in the South, and it will be most interesting to settle this point. I do not lay much stress upon the fact of this plume feeding upon one plant here and upon another on the Continent, because *Pterophorus plagiodactylus* does that, if both M. Millière and myself are correct in our figures and descriptions of it; but I should much like to see a single larva of a veritable *Hieracium umbellatum*-feeding plume, and shall feel greatly obliged to anyone who will send me one to figure, and will gladly return as many of the sage-feeder as may be required.

—C. S. Gregson.

Hybernation of Vanessa Urticæ. — The fact of the hybernation of insects in the perfect state is well enough known, but it probably falls to the lot of very few to witness in any instance *the commencement and end* of hybernation. The following may therefore perhaps interest Entomologists. On one of the first Sundays in August last, during divine service, a specimen of *Vanessa Urticæ* flew into the parish church of Winterbourne-Tomson, in which I was officiating. After fluttering in the windows and flying about the church for a short time, the insect settled upon a projecting rafter in a conspicuous place, and remained, with its wings in the usual state of repose, during the remainder of the service. On the Sunday following it was still *in statu quo*; and so, Sunday after Sunday, throughout the autumn and winter, evidently never having once moved from its first position. There it was, until, on Sunday the 5th instant, it came off its perch, and was flying briskly about the church when I came away after the conclusion of the service. Its period of motionless repose had thus been just nine months, and it was apparently as fresh in colour and condition as if just out of the chrysalis.

—O. P.-Cambridge; *Bloxworth*, May 22, 1867.

A Plague of Ants. — The Entomologist has many difficulties to contend with in the pursuit of his work. He is often compelled to watch the changes of the weather as keenly as a meteorologist, and even more anxiously, and accurately time his search for particular species, which, like a thief at large, are "wanted." But there is an annoying obstacle thrown in his way, at least in the Gloucester district, which it seems difficult to mitigate or remove. I allude to the plague of ants. These insects may be very interesting on

account of their intelligence, industry and peculiar economy ; but when these qualities are employed to your detriment you look at them in a very different light. I lately, with a friend, explored a large wood about eight miles from here ; every tree-trunk that was examined disclosed hundreds of the red ant coursing up and down. No wonder we only found one larva in the chinks of the bark. We then went to work beating into our umbrellas, but found these active gentry quite as thick among the branches as they had been on the boles of the trees, for every blow of the stick brought down scores of them ; and when a stray larva now and then appeared an interesting struggle ensued among the ants as to which was to have him. Sometimes one would get hold of a poor larva by the head, and begin to run him off, when another ant would seize the other extremity ; and it was surprising to see how much stretching the larva would undergo in these struggles. This might be amusing enough with common larvæ, but when one worthy of attention was seized it became another matter. These active fellows seemed all over the wood, much thicker even than they were last year ; and when luncheon time came it was laughable to see them picking up the crumbs, frequently hurrying along with pieces three or four times their own size. That they destroy large numbers of larvæ and pupæ of lepidopterous insects I fully believe, as the paucity of our captures proved. Another wood, six miles from Gloucester, swarms with the black ant, and their huge hills may be found in every direction. At this place we found these fellows altogether too much for us, for in their active investigations they swarmed all over us, and insinuated themselves under our clothing, when, one of us getting a sharp bite on a very tender part of the person, we beat a retreat. These insects, however, are not confined to the woods here, but frequently occur on hedges with no woods near. I was observing a large nest of *E. Lanestris* the other evening, and was surprised to see my brown friends promenading about over the nest and larvæ, which were walking or lying about, but which they left quite unmolested, though the ants walked over heaps of them, an irritated or tickled larva sometimes jerking one off. With ants so numerous in this locality, it is not surprising that they are in my own and neighbours'

gardens, and it is no easy matter to keep them out of the breeding-cages. While engaged the other day in cutting out a pupa of *T. Formicæforme* from a withy stump, several ants stood close by, watching my excavations most attentively, and whenever a pause was made they ran into the hole to see if I had disintombed anything good for them, and they would very soon have walked off my pupa if I had not. Is there any other remedy for this evil than destroying the ant-hills in winter? — *Joseph Merrin; Gloucester, June 13, 1867.*

Dianthæcii Barrettii.—I got back from Ireland yesterday, and just write a line to say I have taken several more specimens of *Dianthæcia Barrettii*: I have made out the locality and habits of the insect. I have found the larvæ of *Lithosia caniola* eating lichen, in accordance with the habits of the genus. — *Edwin Birchall; College House, Bradford, June 19, 1867.*

Adela cuprella.—*A. cuprella* seems to have been scarce this year on Wimbledon Common. I saw two on the 23rd of April, and about a dozen on the 29th. I heard of two collectors who had looked for it, but had not taken one; and a third collector had only taken two females after several fruitless journeys. Perhaps this scarcity may be partly attributed to the continued bad weather last year between the 27th of April, when the females had just emerged, and the 4th of May, the effect of which was to kill nearly all the insects, and no doubt many of the females before impregnation took place.—*N. C. Tuely.*

Preponderance of Males.—On the 16th of May, at Portishead, I saw upwards of two hundred male *Adela viridella*, but by the most careful search could only discover one female. Perhaps the habits of the female are different to those of the female *cuprella*, which always fly with the males.—*Id.*

Proportionate Smallness of the Male in Lepidoptera.—In your report of the Entomological Society's Meeting of the 4th of February, Mr. Wallace gives what appears to me a very singular reason for the male being smaller in *Lepidoptera*. Surely small males would produce small females as well as small males? and how can such a rule be applied to the hibernating butterflies?—*Id.*

Hop Insects.—I shall be obliged for the name and any information about the insects which I enclose: they are found on the under side of the hop-leaf; they jump nimbly, riddle the leaves (as the enclosed pieces will show), and puncture the young bine. We call them here “cuckoos.”—*Lovell Squire.*

[The insects are a species of *Typhlocyba*: I cannot give the specific name with any certainty; but the damage they are doing to the hops this summer is really fearful.—*Edward Newman.*]

Proceedings of the Entomological Society of London.

May 6, 1867.—Professor Westwood, Vice-President, in the chair.

Mr. J. Sidebotham, of 19, George Street, Manchester, was elected a Member. M. S. C. Snellen van Vollenhoven, of Leyden, was elected a Corresponding Member.

Mr. Stainton exhibited cases of *Coleophora lixella*, the larva of which, when young, was found to feed on *Thymus serpyllum*, but afterwards transferred itself to a species of grass: cases were shown which were found on grass, but composed of portions of the leaf or calyx of thyme.

The Secretary read a letter from Mr. R. W. Fereday, Corresponding Member, of Christchurch, Canterbury, New Zealand, dated 4th of February, 1867, of which the following is an extract:—“I have much satisfaction in communicating to the Society the capture of a specimen of *Pyrameis Cardui*, in the province of Canterbury, on the 5th January last. The plains of Canterbury are separated from the west coast of the island by a range of mountains; one of these is named Mount Torlesse, and is about 6000 feet above the level of the sea: immediately adjoining are some lower hills, and it was at the summit of one of these, about 3000 feet above the sea, that I met with this butterfly, and made the capture. It was flying about and settling on a piece of rock, the herbage up to the top of the hill being tolerably luxuriant amongst the stones. It is the only specimen I have seen, and have not heard of any one else having seen one in this colony. It is so precisely like my English specimens in size, colour and

markings, with one exception, that I entertain no doubt of the identity of the species. I attribute the exception to a local variation; it is with respect to the round spots on the hind wings, which in my British specimens have no distinct centres, whilst in this specimen ocelli take the place of mere spots; it is, as it were, a spot of bright light blue, the same colour as the small blue marks at the anal angle of the hind wings, introduced into the centres of the normal spots of the English specimens. I enclose a photograph of it. I do not recollect whether any of the British examples have the blue centres to the spots. If the insect is *Pyrameis Cardui*, of which I do not entertain a doubt, this capture is important, as it will add the link which will complete the circuit of the globe in the range of this species."

June 3, 1867. — Sir John Lubbock, Bart., President, in the chair.

Mr. Bond exhibited a small moth, belonging to the Tortrices, captured during the preceding week in Darenth Wood, by Mr. E. G. Meek, and which he believed to be new to the British list.

Mr. Bond also exhibited a variety of *Adela DeGeerella* (male), captured at Charlton in 1866, and having the wings entirely suffused with bright golden.

Mr. F. Smith exhibited an old razor-case, in one of the compartments of which was a nest of *Odynerus quadratus*: the case had been allowed to lie on a shelf near an open window, and entry was effected through a hole in the bottom. In August, 1866, it was sent to Mr. Smith, with a request that he would name the occupant; but he was then unable to determine the species, as several wasps of the genus *Odynerus* were known to construct similar nests in crevices of old walls, holes in posts, and frequently in banks; and various instances of the construction of their nests in odd situations were on record. Thus, Prof. Westwood had mentioned an instance of *O. quadratus* building its nest in the folds of a piece of paper; Mr. Curtis had discovered a nest of *O. parietum* on the top of a book; and a friend of Mr. Smith's had once brought him an octave flute, which had been left in an arbour during a few days' absence, and in the bore of which *O. quadratus* had built its mud-cells. The cells constructed in the razor-case produced ten males and four females; the

cells were placed in various positions, necessitated probably by the form of the case and the confined space; the four female cells and six of the male cells were placed transversely, the rest were in a longitudinal direction; one cell was empty, and was placed obliquely to the sides of the case. The development of the insects was as follows:—On the 20th March, 1867, they were still in the larva state; by the 10th May they had changed to pupæ; on the 22nd May six males came forth; on the 25th three males; on the 30th one male; on the 1st June three females appeared; and on the 3rd another female. Not a single parasite was obtained. Mr. Smith added that he had bred most of the species of *Odynerus*, and had found that the number of males always exceeded the number of females, in the proportion of three to one or thereabouts.

Prof. Westwood was able to add another instance to the list of curious localities for wasps and bees' nests. Mr. Higgins had a Peruvian drinking-vessel, in the form of some uncouth imaginary quadruped, the mouth-piece being in the back of the animal; and in this cup, at the extremity of one of the creature's legs, a bee had built its nest.

Mr. McLachlan remarked that he had recently seen the male (*S. linearis*, *Klug.*) of the saw-fly, *Strongylogaster cingulatus*, in some numbers near Croydon; although the female was generally very abundant, the male was very rarely seen. He alluded also to the apparent total absence of males of many species of *Tenthredinidæ*, as *e. g.* in *Selandria stramineipes*, the females of which were universally abundant, in company with the *Strongylogaster*, on the young fern, in spring. It would almost seem as if these were cases of parthenogenesis.

Mr. Janson mentioned *Tomicus villosus* as a nearly parallel case among the *Coleoptera*: it was true Ratzeburg figured an insect which was said to be the male, but though myriads of the female were found annually, he believed that the male had never been detected in this country.

The President exhibited a specimen of one of the wingless *Diptera* which he had found at Farnborough, Kent, under bark, in company with *Thysanura*. He believed it to be the *Epidapus venaticus* of Haliday (see Walker, *Ins. Brit. Diptera*, iii. 56).

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No. 44.]

AUGUST, MDCCCLXVII.

[PRICE 6D.

A Revision of the Characters and Synonymes of British Bees. By FREDERICK SMITH, Esq.

(Continued from page 298).

Genus *PROSOPIS*, Latr.

A long and diligent study of the habits of the extensive family Andrenidæ, combined with the labours of other Entomologists, has induced me to adopt the opinion that not a single species belonging to it is a parasite: this opinion may hereafter prove to have been an erroneous one, but, if so, the exceptions must occur, I think, in the species of genera not indigenous to this country, and I must be understood to speak decisively on the habits of indigenous species only.

The genera *Prosopis* and *Sphecodes*, being destitute of the usual appendages adapted to convey pollen, were placed in the division of parasites by St. Fargeau and some other hymenopterists, but direct observation has proved the instability of the theory founded upon these circumstances.

The more closely we investigate the habits of insects the more indelibly will it be impressed upon our minds that the only reliable data is the observation of facts.

Mr. Shuckard, in his recent work on the 'British Bees,' observes that "the merit that attaches to the discovery of such facts is due merely to patience and diligence, very common attributes." I take this opportunity of more particularly exhorting my younger brother hymenopterists not to be misled by such a fallacious opinion, but to persevere in their investigations, recording the minutest phase that may present itself, and to be fully assured that it is by tracing their varied habits, carefully noticing their multifarious operations, and by the accumulation of every minute fact in connexion with their history, that we can ever hope to arrive at a perfect knowledge of "these his creatures:" this should be our end and aim, and this constitutes the true science of Entomology.

As far back as the year 1842 Dr. Thwaites proved the species belonging to the genus *Prosopis* were not parasitic insects: he discovered the burrows of these insects excavated in the pith of dead branches of the common bramble: by splitting such sticks he exposed the rows of cells. The burrows were coated with a thin layer of gluten, the cells arranged regularly end to end, divided from each other by a thin partition, the outer ones producing males, which came out first.

A new species was reared from the bramble-sticks, and specimens were sent to myself, and subsequently described as *Prosopis hyalinatus*. This species is very abundant at Walmer, in Kent, where, at the beginning of June, 1866, I observed it entering perforated bramble-sticks: these I possessed myself of, and, on splitting them open a few weeks afterwards, found a full-grown larva in each cell: these have remained in a lethargic state through the winter months, and will probably undergo their final change about the month of May.

A few years ago Mr. Douglas collected some perforated stems of the common dock, from which I reared the rare *Prosopis dilatata*: I collected similar stems near Lowestoft, in the month of August, 1858, and reared the same species from them in June of the following year. This rare bee also occurs at Walmer, in Kent.

I take annually *P. signata* in my own garden, entering holes in the mortar of a brick wall. These bees occasionally use any ready-made hole or crevice adapted to their requirements. I have recorded one instance of a nest being discovered in a hollow flint, which contained a number of cocoons or cells, ranged irregularly in the hollow space.

No Entomologist has more carefully studied the habits of these bees than Mr. Sidney Saunders: in Albania he formed a most interesting collection of their nests, which he subsequently presented to the British Museum. The species whose habits were investigated were *P. rubicola*, *P. versicolor* and *P. gibbus*, none of which are found in this country. In one stick three separate tunnels were excavated, one of which was divided into six cells: the tunnels were coated with a transparent membrane, separable from the sides of the burrow. A careful examination of numerous sticks appeared to prove that ready-formed tunnels are occupied by these

bees, as in some instances cells of fossorial insects were found at the extremity of tunnels that also contained cells of *Prosopis*, the fossorial species belonging to the genus *Cemonus*, the species of which are well known to provision their own nests with Aphides. Another stick contained cells of a species of *Odynerus*. *Prosopis* had also constructed her cells in the same burrow, transversely, the burrow of the wasp being too wide in diameter to enable the bee to place them conveniently in a longitudinal direction. In another instance *Prosopis* had availed herself of the ready-formed burrow of an *Osmia*, constructing her cells towards the mouth of the tunnel.

The three species whose habits were so closely investigated by Mr. Saunders were all subject to the attacks of a species of *Stylops*, *Hylecthrus Rubi*. In this country the only instance of such parasitism with which I am acquainted is one communicated to me by Mr. Walcott, who possesses two specimens, captured, I believe, near Bristol, from which a *Stylops* had evidently emerged, the abdominal plates being distorted, and the cavities from which the parasite had escaped very evident: among the hundreds that I have examined, captured principally in the neighbourhood of London, no such instance has occurred; we may therefore conclude that the parasite is very local.

These bees are frequently to be found in considerable numbers on mignonette, both the wild and garden species proving equally attractive to them. The only other flower on which I have seen them habitually is that of the common bramble.

1. *Prosopis communis*, *Smith, Bees Great Brit.* p. 8;
Schenck, Hym. Nassau, p. 321.

Melitta annulata, *Kirby, Mon. Ap. Angl.* ii. 36 (*nec Linn.*)

Hylæus communis, *Nyland. Ap. Boreal. Revis.* p. 234.

Dr. Nylander first pointed out the differences between this insect and the Linnean species, *Apis annulata*; the latter is also synonymous with the *Hylæus borealis* of Nylander's 'Apes Boreales Supplementum.' The typical specimen, described by Linneus, is preserved in the collection of the Linnean Society. This species is exceedingly abundant around London; I have also found it in Yorkshire, Suffolk,

Kent and Hampshire: I suspect it is very generally distributed.

2. *Prosopis dilatata*, *Smith, Bees Great Brit.* p. 9, male, female; *Schenck, Hym. Nassau*, p. 318.

Melitta dilatata, *Kirby, Mon. Ap. Angl.* ii. 39, male.

M. annularis, *Id.*, ii. 38, female.

Hylæus dilatatus, *Curtis, Brit. Ent.* viii. fol. 273; *Nyland. Ap. Boreal.* p. 94.

The localities known for this rare species are Barham and Pakefield, in Suffolk; Arundel; Hawley, near Blackwater, Hants; and Kingsdown, near Deal. It burrows, as I have shown, in dock-stems, and also, as I observed, at Kingsdown, in dead sticks of the bramble.

The markings on the face, in this species, as well as on the legs, are white; in *P. communis* they are yellow.

The male of *P. variegatus* has the scape of the antennæ dilated in the same way as the male of this species, and has been forwarded to me as a coloured variety of it, but the sculpture of the metathorax is very different, and in other particulars they are too dissimilar to admit of being considered identical.

3. *Prosopis cornuta*, *Smith, Bees Great Brit.* p. 10, male, female.

Hylæus cornutus, *Smith, Trans. Ent. Soc.* iv. 32, female.

H. plantaris, *Id.*, iv. 32, male.

The name given to this species is that which Kirby had proposed in his own interleaved copy of the 'Monographia': the male was unknown to him. The propriety of uniting the sexes was confirmed by my rearing them from the same nidus, as I have shown in the introductory remarks. The known localities for the species are Barham, in Suffolk; Cove Common, near Blackwater, Hants; and Croydon, Surrey.

4. *Prosopis punctulatissima*, *Smith, Bees Great Brit.* p. 11, male, female.

Hylæus punctulatissimus, *Smith, Trans. Ent. Soc. Lond.* iv. 33.

Prosopis armillata, *Nyland. Ap. Boreal.* p. 189?

I only once captured this species, about twenty years ago: it most strongly resembles *P. signata*. The female is readily distinguished by the strong punctuation, particularly that on the basal segment of the abdomen. The male differs

from that of *P. signata* by having a yellow spot on the scape and tegulæ. I strongly suspect the *P. armillata* of Nylander to be synonymous with it.

I captured this species at Birch Wood, in Kent, in 1840, since which I have not met with it.

5. *Prosopis signata*, *Smith, Bees Great Brit.* p. 12, male, female; *Nyland. Ap. Boreal.* p. 190; *Schenck, Hym. Nassau*, p. 318.

Sphex signata, *Panz. Faun. Germ.* 53, 2.

Melitta signata, *Kirby, Mon. Ap. Angl.* ii. 41.

Prosopis atrata, *Fabr. Syst. Piez.* p. 295.

This species has been bred from bramble-sticks, and, as I have shown, it sometimes nidificates in the mortar of walls: it is found throughout Europe. I have only observed this species on the flowers of the blackberry and mignonette. Prof. Schenck finds it on the milfoil and tansy.

6. *Prosopis hyalinata*, *Smith, Trans. Ent. Soc. Lond.* iv. 33, male, female; *Bees Great Brit.* p. 13.

This species is extremely abundant in many situations—at Shanklin, in the Isle of Wight; at Walmer, and along the line of coast on the slopes from thence to Dover: it frequents the flowers of the common bramble. The face of the male is white, as in the same sex of *P. signata*.

7. *Prosopis variegata*, *Fabr. Syst. Piez.* p. 259; *St. Farg. Hym.* ii. 534, 1; *Lucas, Expto. Sc. Alger.* iii. 223; *Smith, Bees Great Brit.* p. 14; *Schenck, Hym. Nassau*, p. 318.

Prosopis colorata, *Panz. Faun. Germ.* 89, 14.

First taken by Dr. Leach, at Kingsbridge, Devon: I obtained a specimen from a collection of insects made at Biddeford. It has been suggested that this insect is only a coloured variety of *P. signata*; but the difference of form in the prothorax, &c., satisfies me that it is distinct from that species.

8. *Prosopis bifasciata*, *Jurine, Hym.* p. 220, t. 11, f. 30; *St. Farg. Hym.* ii. 536; *Smith, Cat. Hym. Ins.* i. p. 22.

Female.—Length $3\frac{1}{2}$ —4 lines. Head and thorax black; abdomen red. Head closely and strongly punctured, an elongated cream-coloured spot on each side of the face close to the eyes; the antennæ obscurely ferruginous beneath; the

tips of the mandibles and the anterior margin of the clypeus more or less ferruginous, occasionally with a minute whitish spot towards the anterior margin of the clypeus. Thorax oblong, with strong confluent punctures; the collar with a cream-coloured slightly interrupted line; the tubercles, a spot on the tegulæ, a triangular spot on each side of the base of the scutellum, cream-coloured; the extreme base of the tibiæ white, the posterior pair to one-third of their length; the tips of the claw-joint of the tarsi ferruginous; wings hyaline, faintly cloudly at their apical margins; the nervures dark brown. Abdomen closely and rather strongly punctured; the two basal segments red, with their apical margins more or less black. *Mule*.—Closely resembles the female, but with the face, mandibles and scape in front yellowish white; the flagellum, except the basal joint, pale ferruginous. Abdomen as in the female, occasionally entirely black, with approaches thereto in different specimens.

This species is included in the British list on the authority of a single specimen, female, taken by Dr. Leach at Bantham, a village about four miles from Kingsbridge, S. Devon. This unique insect is in the British Museum Collection of Hymenoptera.

Several of the once doubtful Devonshire insects in the Leachian collection have of late years been rediscovered, and this will in all probability be found when the neighbourhood of Kingsbridge is well collected over. The species occurs in France, Italy and Albania.

FREDERICK SMITH.

(To be continued).

A Day in Man. By EDWIN BIRCHALL, Esq.

DURING the last week of June, accompanied by my friend Nicholas Cooke, I paid a short visit to the island. "The stormy seas of Man" were fortunately absent on the occasion, though the rugged coast shows them to be no fiction of the poet's brain; and the good ship 'Tynwald' ploughed her rapid way through the gently heaving summer sea, casting anchor under Douglas Head, eighty-two miles from Liverpool, in a little more than five hours.

Land was never out of sight, the high ground of the Isle of Man being well seen before Snowdon sank below the southern horizon, and the Cumberland mountains were visible throughout the voyage.

Approached from the east the island presents the appearance of an irregular mountainous ridge rising abruptly from the sea, without any strikingly lofty summits, although Snaefel is 2000 feet in height, and other mountains approach the same altitude. The eastern cliffs, composed of clay schist, probably of silurian age, are precipitous, and in some places 300 feet in height, but on the western side of the island, between Peel and the Calf of Man, they reach the stupendous height of 1000 feet.

The greater part of the surface of the island is composed of clay or slate rocks, which are surrounded by a fringe of tertiary deposits, both marine and fresh-water, of a very recent geological period, during which the Isle of Man probably consisted of a chain of small islands, four or more in number, the valleys running across the island (one from Douglas to Peel is extremely well marked) indicating the old sea-channels: through these we may suppose the icebergs to have drifted, depositing the clay, gravel and boulders with which they are now covered. There are numerous bogs in hollows excavated in the tertiary strata: in these remains of the Irish elk (*Megacerus hibernicus*) are frequently found. The Rev. J. G. Cumming, in a valuable paper on the Geology of the island, published in the second volume of the 'Geological Journal,' states that at the mouth of the Strandhall Brook there is a submerged forest, and that the trunk of an oak tree obtained from it exhibited upon its surface the marks of a hatchet. That the human race inhabited the island contemporaneously with the Irish elk admits of no question, as rude implements have been found associated with the bones: the submerged forest and the hatchet-marked tree speak of a still earlier age,—of a primæval man who may have witnessed the great irruption of the sea which separated the island from the surrounding countries.

I suppose the climate of the island to be very mild. I saw Fuchsias twelve or fourteen feet in height, evidently of many years' standing, growing in the open air; and from the observations which my short stay enabled me to make I do not

think the indigenous species of insects are by any means so few in number as previous accounts had led me to suppose. If Entomologists who may visit the island in search of the rarities it is now known to produce will follow up the good work commenced by the Rev. Hugh Stowell (see 'Zoologist' for 1862), we may shortly hope to obtain a tolerably complete catalogue of the island fauna.

Amongst my captures were :—

Sesia philanthiformis. Flying in the sunshine on the cliffs. I observed it to settle on the rocks, also on the wild thyme.

Dianthœcia cœsia. Both sexes in fine condition, at the flowers of *Silene maritima*, at dusk. The moth appears to have a decided preference for flowers growing in almost inaccessible places on the cliffs: we watched fine patches of the plant on the shore without success.

D. capsophila. Flying with *D. cœsia*.

Eupithecia venosata; *E. campanulata*; *Chærocampa Porcellus*. At flowers.

Phycis subornatella. Common on the cliffs, among wild thyme. Flies in sunshine.

Ennychia cingulalis. In same localities as *Phycis subornatella*, in great profusion.

Sericoris littorana.

Eupœcilia atricapitana.

Of the Coleoptera the only species taken which are not included in Mr. Stowell's list were *Cicindela campestris* and *Cetonia ænea*.

Like Ireland, the Isle of Man is said to harbour neither moles, snakes nor toads (your true Irishman resents the notion that the natterjack, common in the South of Ireland, is a true toad); and the races of the tail-less cat and fowl for which it has been famed appear to be fast disappearing, or adopting the English fashion of tails. Cats are to be seen with tails of all lengths, from the mere stump to the fully-developed appendage, and some of the apologies for a tail are truly ludicrous.

EDWIN BIRCHALL.

Bradford, July 10, 1867.

Entomological Notes and Captures.

Entomology at Wareham. — Have any of the readers of the 'Entomologist' observed the great paucity there has been, so far, of Lepidoptera? During this month I do not think the butterflies I have come across, and I am about a good deal, have much, if at all, exceeded a score of all sorts; and from the other side of this county I get the like report. At the end of April and beginning of May, however, I met with *Pyrameis Cardui* in greater abundance than I ever remember having seen it before; but besides this species and a few specimens of *P. Atalanta* no butterflies even then were to be seen. A correspondent some time since asked whether *Macroglossa Stellatarum* had been seen in more than usual abundance last season, owing to their great abundance the previous year. As far as I was concerned I found them scarcer than usual, and find I have only recorded seeing two for the season—one on April 18th, the other in August. — (Rev.) *J. L. Langdon Fulford; Combe Keynes, Wareham, June 25, 1867.*

Captures in Kent, Essex and Surrey, during June and July. — I have taken *Euthemonia Russula*, *Epione advenaria*, *Erastria venustula*, *Cidaria picata*, *Madopa salicalis*, *Hypena crassalis*, *Agrotis saucia*, *Calligenia miniata*, *Chrosis Audouinana*, *Olindia ulmana*, *Limacodes Asellus* (one specimen). I have also had the pleasure of taking six specimens of that most beautiful species *Hypercallia Christiana*, in beautiful condition. — *Thomas Eedle; 9, Maidstone Place, Goldsmith's Row, Hackney Road, July 12, 1867.*

Colias Edusa at Gravesend. — While out with my net on the 26th ultimo I saw, but was unable to capture, a fine specimen of *C. Edusa*. As this is an unusual time for its appearance I send a notice of it. By a reference to the 'Entomologist' for March, 1866, I see its appearance in the month of June has already been noted. — (Rev.) *P. H. Jennings; Longfield Rectory, Gravesend, July 3, 1867.*

Abundance of the Larva of Pyrameis Cardui. — The larva of *Pyrameis Cardui* has been taken in great abundance this month at Burnt Ash Lane and on the railway-banks at Forest Hill. I have taken a few myself from each place, and there are abundance of small larvæ at the present time. My

first changed to pupa on the 4th, and the imago emerged on the 14th, of July. On the 17th I took a few larvæ one-fourth of an inch in length. Do you think the early images the parents, or the old ones of last year?—*W. West* ; 6, *Green Lane, Greenwich, July 18, 1867.*

Lycæna Arion near Gloucester.—*Lycæna Arion* has turned up again here. I captured three pairs on the 20th, 21st and 22nd, in beautiful condition; and a few days later a fourth pair, rather worn. On the 29th I was out with a friend, when we caught seven specimens, but in very bad condition, and we let some fly again in consequence.—*Herbert W. Marsden* ; *Cox's Farm, Upton, St. Leonard's, Gloucester, July 2, 1867.*

Acherontia Atropos near Cockermouth.—A large and very fine female specimen of the above-named insect was caught by a friend of mine on the 7th of this month; two others were seen near the same place, which he supposed to be males.—*George Mawson.*

Sesia scoliæformis in Scotland.—Three years ago I found an empty pupa-skin protruding from the trunk of a birch-tree near Loch Rannoch; and on Monday last, the 15th instant, my son, Benjamin Cooke, jun., took a fine female *Sesia scoliæformis*, which I had the pleasure of setting this morning. I did not announce the discovery three years ago, because I thought it desirable to wait till the capture of the perfect insect confirmed the fact of its existence in Scotland. I believe this to be the first instance of its capture north of Llangollen.—*Nicholas Cooke* ; *Spring View, Liscard, July 17, 1867.*

Precocious Larvæ of Orgyia gonostigma.—In the 'Entomologist' for October, 1866 (No. 33, p. 152), I gave some account of a precocious brood of the larvæ of *O. gonostigma*. So much were they in advance of the normal state that I had good reason to expect a second brood of the imagos the same summer. I will transcribe the concluding few lines of the paragraph, which run thus:—"The larvæ are now (Sept. 10th) passing the third moult, and I fully expect the transformation to pupæ will take place at the close of the present month, and that the imagos will appear about the middle of October. I shall in due time report the result." I am now able to fulfil that promise. Scarcely had the report been

despatched when the larvæ showed symptoms of hibernation: they ceased to feed, except occasionally and sparingly, secreting themselves among the foliage of the food-plant, and finally constructing slight hybernaculi, here and there three or four uniting to form one domicile, I suppose either to economise labour or for the purpose of enjoying agreeable society during the dreary winter months. They remained close until I was able, in the following spring (1867), to supply food, when I removed them to a higher temperature: they at once came forth, and commenced feeding: this was the 1st of May. About the middle of the month they laid up for the fourth moult (which was very prolonged), and on the 3rd of June began to form the cocoons, the males doing so at least a week earlier than the females. On the 1st of July the imagos began to appear. This attempt and failure show that where there is not a natural tendency to double-broodedness it is difficult to attain it by forcing, although we know, where there *is* that tendency, as in *Notodonta ziczac*, *N. palpina*, &c., even a third brood may occasionally be obtained.—*George Gascoyne ; Newark, July 16, 1867.*

Larva of Epione advenaria.—I think that *Epione advenaria* is more widely distributed than is supposed. It occurs, though sparingly, in most of the woods near Portsmouth, but, owing to a peculiarity it has of almost invariably settling on a bramble when disturbed by the beating-stick, it is oftener seen than captured. I have often obtained eggs from captured females, but could not until this season succeed in rearing the larvæ, their reputed food-plant, the whortleberry, not growing near the place of capture. On the 10th of June last, having again procured eggs from a captured specimen, I determined to try to rear them on bramble, and have so far succeeded in doing so. The young larvæ emerged on the 21st of June, and are now about half-grown. I think that this (the bramble) must be their food-plant in this locality. The young larvæ have a curious habit of rolling themselves into balls, and hanging suspended by a silken thread on the least disturbance of the bramble. In this position they look like so many pellets of frass. If the disturbance is continued they fall to the ground, when it is almost impossible to distinguish them from it. This species, in this district, is

partially double-brooded, being on the wing in June and August.—*H. Moncreaff*; *Southsea*, July 19, 1867.

Campptogramma fluviata in *Derbyshire*.—N. E. Bevan mentioned to me, a few days since, that *Campptogramma fluviata* has been taken in *Derbyshire*: he seemed to think it a new locality.—(*Rev. Sir*) *C. R. Lighton*.

Larvæ of Emmelesia decolorata.—It is with great pleasure that I forward for your acceptance a few larvæ of *Emmelesia decolorata*. The insect was abundant in a plantation at Grimescar, about a mile out of Huddersfield, in the middle of June last; and I derived considerable satisfaction from watching them deposit their eggs: they flew from one flower-head to another, staying but a short time on each, and apparently depositing not more than two or three eggs every time they settled. The egg is bright yellow, and hatches in about eight days: when very young the larva is yellow, with a shining black head, and gradually assumes the colours of those I have sent.—*G. T. Porritt*; 8, *Clare Hill, Huddersfield*, July 24, 1867.

[The larvæ arrived in most excellent condition, and a description will very shortly be published.—*E. Newman*.]

Herminia grisealis and *Agrophila sulphuralis*.—On the 18th of June we reared seventeen specimens of *Herminia grisealis*, from larvæ found near Brandon in July, 1866, feeding upon *Sisymbrium Sophia*. We have also at the present time some larvæ of *Agrophila sulphuralis* feeding upon *Convolvulus arvensis*: they are too small now to enable us to give a full description. The *Rev. Mr. Hellins* has the larvæ of both these species, and will give a detailed description of them at some future time.—*T. and J. Brown*; *King's Parade, Cambridge*, July 18, 1867.

Fleas at Ventnor.—I was amused by reading Captain Hadfield's notice, in this month's 'Zoologist,' of the number of fleas at Ventnor. I remember staying there in lodgings when quite a child, and so dreadfully was I bitten by these voracious little pests that to this day I can never hear Ventnor mentioned without thinking of the fleas associated in my mind with it. Indeed, remembering the ordeal I then went through, I am not sure that I should not hesitate to visit Ventnor again even now, especially as Captain Hadfield intimates that this year at least they are quite as numerous as I

painfully remember them to have been.—*Gerard Barton ; Wymondham, July 17, 1867.*

[I add the note to which Mr. Barton refers.—*E. N.*]

Fleas at Ventnor.—Observing a note remarking on the decrease of fleas of late years, it may interest the writer and others to learn that in this neighbourhood, on the contrary, they were never to my knowledge so numerous as at the period referred to: I remember to have heard great complaints. I am not aware whether fleas breed and multiply on our shores, though in the South of India I have found them among the sand-hillocks skirting the sea in countless numbers.—*Henry Hadfield ; Ventnor, Isle of Wight.*

What is the Natural Food of Fleas, &c. ?—I have often speculated on the natural food of those bloodthirsty females of the dipterous world, Culices, Pulices and Simulia, which torment the unlucky human who penetrates their fastnesses. In the northern regions of both continents, where man has no dwelling-place, these tribes swarm in countless millions. Another question, do the males of any dipteran suck the blood of man?—*Edward Newman.*

Sirex Gigas.—I had a specimen of this insect brought me last summer. Would you kindly inform me as to its habits, as I have not met with it here before or since.—*H. McDowall ; Kettering, March 4, 1867.*

[The larva feeds in the interior of the trunks of the larch-fir, making large galleries, and doing an incredible amount of damage.—*E. Newman.*]

Proceedings of the Entomological Society of London.

July 1, 1867.—Sir John Lubbock, Bart., President, in the chair.

Dr. George William Davidson, of 13, Union Place, Edinburgh, was ballotted for, and elected a Member.

Mr. M'Lachlan exhibited *Ciniflo ferox* from Folkestone, where that spider had been captured by Dr. Knaggs.

The Secretary exhibited branches and the fruit of an orange-tree infested with some insect, with regard to which information was requested by Mr. Charles Moore.

The Hon. Thomas De Grey exhibited *Eupæcilia anthemi-*

dana and *E. rupicola* from Norfolk; and mentioned that he had on the previous day captured in Kent five specimens of *Hypercallia Christierninana*.

A paper by Mr. John Lowe, of Edinburgh, intituled "Observations on Dzierzon's Theory of Reproduction in the Honey-bee," was read. With a view to test the truth of the theory that "all eggs which come to maturity in the two ovaries of a queen-bee are only of one and the same type, which, when they are laid without coming in contact with the male semen, become developed into male bees, but, on the contrary, when they are fertilized by male semen, produce female bees,"—from which theory, if true, we might, in the words of Von Siebold, "expect beforehand that by the copulation of a unicolorous blackish brown German and a reddish brown Italian bee, the mixture of the two races would only be expressed in the hybrid females or workers, but not in the drones, which, as proceeding from unfecundated eggs, must remain purely German or purely Italian, according as the queen selected for the production of hybrids belonged to the German or Italian race,"—the writer set to work to obtain hybrids between *Apis mellifica* and *A. ligustica*, and also between *A. mellifica* and *A. fasciata*; and the result of his experiments was that Ligurian queen-bees fertilized by English drones and Egyptian queen-bees fertilized by English drones, both produced drones which, as well as the workers, were hybrid in their characters, and bore unmistakable evidence of the influence of the male parent. From this the Author drew the conclusion that the eggs of a queen-bee which had been fertilized by a drone of another race, whether they develop into drones or workers, are in some way affected by the act of fecundation, and that both sexes of the progeny partake of the paternal and maternal character or race; from which it followed that Dzierzon's was not the true theory of reproduction in the honey-bee. Specimens of the hybrids were exhibited to the Meeting, and Mr. Smith (who did not consider *Apis ligustica* to be specifically distinct from *A. mellifica*), after an examination of the specimens, corroborated Mr. Lowe's statement that the hybrid drones distinctly showed characters peculiar to *A. mellifica* in combination with the characters which distinguish *A. ligustica* and *A. fasciata* respectively.

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*Answer to Mr. Kirby's Note in the July Number of the
'Entomologist.'* By A. G. BUTLER, Esq., F.Z.S.

THERE are several points in Mr. Kirby's criticism of my "Remarks on Nomenclature" (Entom. iii. 291) to which I should wish again to call the attention of the readers of the 'Entomologist.'

First, he states that *Erebia Tisiphone* and *glacialis* of Esper are noted by Staudinger as varieties of *E. Alecto* of Hübner: clearly Mr. Kirby has not fallen into the same error, for it must surely be one, seeing that this species must in such case have come into being nearly thirty years after its varieties: moreover, I do not for one moment believe that Esper's figures of the two insects represent one species; I consider *Tisiphone* is the butterfly which was subsequently figured by Hübner under the name of *cæcilia*, which last is certainly not the *cæcilia* of Esper.

Again, as regards the propriety of reviving the specific name of *Fagi*: when we consider the vast number of nonsense-names already applied to *Lepidoptera*, and the inappropriateness of many of such names as actually have a meaning, it seems somewhat arbitrary to reject one short euphonious name because, being acquainted with the history of the species, we have made up our minds that the name first applied had particular reference to the food-plant of the larva. If we are to be compelled to study the life-history of every European butterfly before we determine upon adopting its name, there will be plenty of room for correction in our nomenclature.

Most Entomologists are now ready to allow that euphony is the most important thing in the fabrication of names, whether we use a dictionary, shake up letters in a bag, or industriously cudgel our own brains; and since such is the case I should myself prefer to retain the original spelling of

the names Hyperantus, Climene and Tithonius, with all their primitive defects.

The rejection of Hübner's genera is a piece of tyranny that ought not to be suffered; for surely, if we have a right to judge of the amount of description necessary to the constitution of a genus, it will become merely a matter of opinion as to which genera are sufficiently characterized and which are not: if we now reject Hübner's descriptions, as not being complete enough to suit the views of the present generation, there can be no guarantee that our own descriptions will not be objected to by our posterity on the same score.

Lastly, Mr. Kirby has quite misunderstood my remark concerning Arge: I do not myself think there is sufficient reason for rejecting it as a generic title; my observation only referred to the fact that Esper is usually quoted as the author of the genus, whereas he only applied the name specifically.

A. G. BUTLER.

Zoological Department,
British Museum, Aug. 5, 1867.

A Revision of the Characters and Synonymes of British Bees. By FREDERICK SMITH, Esq.

(Continued from page 311).

Fam. ANDRENIDÆ, *Leach*.
Section 2. ACUTILINGUES, *Westw.*
Genus SPHECODES, *Latr.*

In the 'Monograph on the Bees of Great Britain,' I gave a somewhat detailed history of this genus: it became necessary to do so, in order to establish the opinion that I entertained of their being working bees, and not, as had been previously supposed by many hymenopterists, parasites on the genus Halictus.

My opinion has been recently adopted by Dr. Sichel, who has most assiduously investigated their habits, and who has confirmed every particular which I had recorded in proof of their industrial habits. The author of the work on the 'British Bees,' recently published, doubts the sufficiency of

my observations, and says their non-parasitism "still remains a debatable point:" it therefore becomes necessary to bring together all the evidence with which I am acquainted, in order, as far as possible, to arrive at a more satisfactory conclusion.

I have several times observed species of *Sphecodes* busily engaged in the act of burrowing, sometimes among colonies of *Halicti*, at other times in close proximity to the burrows of those bees; but I have also observed them so engaged where no *Halicti* were to be found. I never observed *Sphecodes* enter the burrows of *Halictus*.

On one occasion I discovered a mixed colony of *H. abdominalis* and *H. Morio*: intermingled with and near to this I found *Sphecodes subquadratus* entering its own burrows; these were intermediate in width to those of the two species of *Halictus*: I had repeated opportunities of visiting these colonies, and of devoting much time to observing them.

St. Fargeau says the species of *Sphecodes* are parasitic upon those of *Andrena*, *Halictus* and *Dasypoda*; but he records no facts of observation in support of his theory. All those species of bees that are not furnished with pollen-brushes on the abdomen or legs were regarded by this hymenopterist as parasites, a supposition that has long been conclusively refuted. Spinola, Thwaites and myself have proved the industrial habit of *Ceratina*, and *Prosopis* has also been removed from the list of parasites.

In the month of July, 1865, I discovered a colony of *Sphecodes subquadratus* at Birch Wood, Kent. Sixteen years had elapsed since I had met with that species; I was therefore induced to devote a considerable time to the observation of their habits, as well as to securing specimens of so rare an insect. Several pairs were captured *in copulâ*, and females were captured in the act of entering and issuing from their burrows. This colony was isolated: no species of *Halictus* or *Andrena* was observed near to the colony of *Sphecodes*. Two or three specimens were taken in the act of turning up the earth at the mouth of their burrows.

Dr. Sichel has published an elaborate paper on the habits and specific distinctions of the genus *Sphecodes* in the 'Annals of the Entomological Society of France' for 1866, in which he states that he observed them working at their nests

and entering them when no Halicti were present, and that he never saw them enter the nests of those bees; he also informs us that he has often taken Sphecodes with the clypeus and head covered with a layer of pollen; they were also observed to discharge honey, like other Mellifera; and these circumstances he considers are sufficient proofs that they provision their own nests. Dr. Sichel points out that they are not completely deprived of polleniferous organs; the first joint of their tarsi is furnished with a little stiff brush beneath, and their posterior tibiæ on the outside has a brush well-developed.

It is true that the burrows of these bees have not yet been examined with sufficient care and success; their stored cells have not been satisfactorily discovered; but so much has been observed that little, if any, doubt remains of their provisioning their own nests; and, as I have previously stated, Dr. Sichel has observed collections of pollen on their face and clypeus. The theory of St. Fargeau has long been ascertained to be erroneous: Spinola published the history of *Ceratina* as far back as 1807, since which Mr. Thwaites has confirmed his account of the industrial habits of that genus. I have myself taken recently-furnished nests of that bee, and observed all its changes from the young larva to the perfect condition of the insect, during the last summer.

That division of the Pompilidæ comprised in the genus *Agenia*, not being armed with spines or serratures on the tibiæ, was supposed by St. Fargeau to be parasitic upon other species of Pompilidæ, but observation has proved that the absence of such armature only indicates a different phase in the economy of that genus. *Agenia punctum*, a rare species in this country, constructs mud cells, which it provisions with spiders: from such a nest I reared a fine series of the sexes of that insect. *A. variegatus* constructs similar cells in holes in walls, old posts, &c.: I observed it conveying spiders into such situations, some years ago, when in Yorkshire, where I found the insect plentifully.

Of the genus *Sphecodes* I consider that we have in this country five well-marked species. Dr. Sichel, in the paper previously alluded to, reduces four of these species into varieties of one, *Sphecodes gibbus*: in this opinion I do not concur: the constant differences of sculpture, as well as of

form, observable in these species, must, in my opinion, prove conclusive of their being perfectly distinct species, as distinct from each other as any two or more of the genus *Bombus*: this I am prepared to establish by the same tests that I applied in separating the males of that genus, namely, by an examination of the sexual organs: taking this test, in conjunction with those of sculpture and form, I have no hesitation in affirming that the difference between *S. gibbus* and *S. rufescens* is quite as great as that which can be found among the six British species of the genus *Vespa*.

Dr. Sichel examined 3200 specimens of the four species of *Sphecodes*, and he states that he found it impossible to separate them into species: they merged so insensibly one into the other that he could arrive at no other conclusion than that they were varieties and sub-varieties of one and the same insect.

In addition to this laborious investigation, he adds that, after examining the sexual organs of the males, "as well as he could see," they were absolutely the same. Another circumstance is recorded in confirmation of the opinion he arrived at, namely, that he captured all the varieties within the space of about two feet ("thirty centimetres.")

Dr. Sichel has obligingly sent, together with a copy of his paper, a series of specimens, intended to show the gradual merging of one species into the other. I must confess my inability to detect any connecting-links between the species. I shall therefore endeavour to point out those constant distinctive specific characters which separate the species. I may also remark that *Sphecodes subquadratus* is rare in this country: after my first capture of the species, nearly twenty years intervened before I again found it; and it must be understood that during that interval I assiduously collected bees on each return of summer, capturing numbers of *Sphecodes*, but not finding a single specimen of *S. subquadratus*.

S. fuscipennis is allowed on all hands to be a good species: it must be extremely local, as no Entomologist has taken it for many years; it is probably confined to the county of Devonshire, where the few specimens found in cabinets of British bees are said to have been captured.

In studying the genus *Sphecodes* the first difficulty that

presents itself is the general uniformity of their colouring ; all have the head and thorax black ; the abdomen red, with the apex more or less black ; the base of the abdomen is also black in the females of one or more species. The colouring of the abdomen varies most in the males ; in *S. ephippia* a variety totally black is sometimes found. Colour therefore cannot be relied upon as a means whereby to discriminate the species. The constant and marked differences which present themselves in form and sculpture render the separation of the species a matter of very slight difficulty.

In the spring, only females of these bees are to be found, but as the summer advances males also appear, and during the autumnal months both sexes are usually very abundant. *S. subquadratus* is, however, rare, and I do not know any precise locality for *S. fuscipennis*.

It has been found that the difference of form in the generative organs of the males of various species of wasps, bees, and of some species of fossorial insects, presents perfectly reliable characters for the separation of species ; this test cannot however, unfortunately, be applied to the males of all the species of bees, but it can be used in the genus *Sphecodes*. After a careful examination of these organs in all our British species, I find such constant and distinctive differences that I am quite convinced of the specific difference of the five species enumerated in this paper. The organs of a number of examples of each species have been examined, and careful drawings made of each, which present constant and excellent specific characters.

I will in the next place endeavour to point out such specific differences as will serve to separate the females of this genus. *Sphecodes gibbus* has the head considerably wider than the thorax ; this is not the case in the other species ; the head is also of a different form behind the eyes, the sides being very abruptly rounded or sloped off. The disk of the thorax of *S. gibbus* is very polished and shining, with punctures wide apart ; the punctuation of the thorax of *S. rufiventris* is very much closer, and is thereby rendered semi-opaque ; this species is also distinguished by having at the base of the metathorax a semicircular space enclosed by an elevated ridge, whilst in *S. gibbus* the ridge is obsolete.

S. subquadratus, female, is at once distinguished by the quadrate form of the head from the same sex of all the other species; the male most closely resembles that of *S. gibbus*, the antennæ being equally elongate and the joints moniliform, but the head is proportionably narrower and subquadrate, and the thorax is much more closely punctured.

S. ephippia is distinguished by its small size; its head is subquadrate, which separates it from small examples of *S. rufescens*: some other distinguishing characters will be found in the remarks upon that species.

S. fuscipennis is at once known by its large size and black wings.

FREDERICK SMITH.

(To be continued).

Description of the Larva of Emmelesia decolorata.—In last month's number of the 'Entomologist' (Entom. iii. 318), Mr. Porritt has given a graphic and most interesting account of the proceedings of the female imago of this *Emmelesia*. As soon as the young larva emerges from the egg it perforates the capsule of the food-plant, *Lychnis dioica*, and feeds on the seeds contained in the interior, of which it henceforth takes possession, and uses, both as a granary and dormitory, never leaving it unless for a similar tenement: within this dwelling it rests in a bent posture, thus accommodating its body to the requirements of the chamber: when extracted it crawls rather rapidly until it finds a vacated capsule or some similar recess, where it can remain concealed from observation: it is full-fed towards the end of July. The head is narrower than the 2nd segment, porrected in crawling, very glabrous, and not notched on the crown; the body is rather obese, almost uniformly cylindrical, and entirely without humps, but it has a few minute warts, each of which emits a fine but short hair from the summit; the 2nd segment has a double dorsal glabrous plate. The colour of the head and dorsal plate is wainscot-brown: the body is putty-coloured, with two rather distant, rather narrow, purple-brown stripes; below each of these, yet above the spiracles, is a linear series of markings of the same hue; and below the spiracles is a narrow stripe, also of the same purple-brown

colour; the ventral area is without markings, as are the claspers; the legs are almost colourless and shining. I am indebted to Mr. Moncreaff and Mr. Porritt for supplies of this larva.—*Edward Newman.*

Description of the Larva of Noctua triangulum.—Found feeding on sallow on the 26th of April. Rolls in a ring when annoyed; head narrower than the 2nd segment, into which it is partially received; body attenuated anteriorly; the 12th segment slightly elevated, the 13th rounded, the anal claspers extended beyond it; colour of head and body pale dingy brown, delicately reticulated with black; there are two dorsal series of oblique oblong markings, commencing on the 5th segment and extending to the 12th; those on the 12th segment are almost united posteriorly; the others are perfectly distinct; each marking is accompanied and almost surrounded by a paler area; there is also a thread-like medio-dorsal paler stripe; on each segment is a transverse series of black dots, and the spiracles are of a deeper black; the legs and claspers concolorous with the body. The larvæ, which were kindly given me by Mr. Barrett, retired under the surface of the earth early in May, and the moths appeared about the middle of June.—*Id.*

Description of the Larva of Noctua brunnea.—Feeds on sallow. Full-fed 26th of April. Rolls in a compact ring when annoyed. Smooth and velvety: head very much narrower than the body; body velvety, attenuated before; 12th segment very stout; 13th rounded. Colour of head pale brown, shining, with a dark longitudinal line on each side the commissure: body dingy olive-brown, with two transversely placed and somewhat triangular marks on the back of the 11th and 12th segments, the apex of the triangles pointing forwards and much attenuated; there is a darker stripe along each side, enclosing the *white* spiracles, and behind each spiracle is a black spot; each segment has a transverse series of minute black dots; legs and claspers concolorous. Changes to a glabrous brown pupa beneath the surface of the ground, and enclosed in a very slight web: the moths appeared the first week in July. I am indebted to Mr. Barrett, of Peckham, for a supply of these larvæ.—*Id.*

Description of the Larva of Noctua festiva.—Rolls in a

lax ring when annoyed, the head being brought into contact with the ventral claspers; the head is glabrous, of about the same width as the 2nd segment, and prone, the cheeks rounded, and there is scarcely any notch on the crown; the body is uniformly cylindrical, smooth and velvety: the colour of the head is pale ferruginous, reticulated with darker brown, and having black ocelli and several other black dots; the colour of the body is dull ferruginous, reticulated and dotted with darker brown: all the markings are very minute; there is a very narrow medio-dorsal thread-like stripe extending from behind the head to the anal extremity; a transverse medio-dorsal line on the 12th and another on the 13th segment; the anterior portion of these is dark brown, the posterior portion nearly white; on each side of the medio-dorsal stripe is a series of whitish spots; the spiracles are nearly white, with a small black blotch behind each; the ventral surface, extending to the spiracles, is paler than the dorsal surface, and there is an appearance of a still paler lateral stripe, which partially includes the spiracles, but is chiefly below them; the legs and claspers are very pale. It feeds on sallow, and my specimens, kindly presented by Mr. Barrett, were full-fed on the 6th of May, and retired beneath the surface of the earth.—*Edward Newman.*

Entomological Notes and Captures.

Sesia philanthiformis in Ireland. — Mr. Gregson records, in the 'Entomologist's Monthly Magazine' for August, the occurrence of *Sesia philanthiformis* in Ireland: he took it freely on the coast at Howth, from the Baths to the round tower in Dublin Bay, where the sea-pink (*Statice armeria*) grows upon the rocks.

Pempelia subornatella in Ireland. — The same Entomologist also records that he has obtained *Pempelia subornatella* in the same locality, in rocky places where *Sedum* grows. Both insects were taken freely.

Parasite on Odonestis potatoria. — A week ago I found a cocoon of the common "drinker" moth, and on opening it I found the pupa had been taken possession of by another insect, the chrysalis-case being filled by other chrysalids.

I put the whole by in a box, thinking no more of it until to-day. During the week, however, the smaller chrysalids had hatched, and the result is about half-a-dozen flies, rather peculiar in appearance, which I have enclosed in a box, and will post it to you, trusting that you may be interested in it. The "drinker" chrysalis I found attached to a dead twig of a yew-tree on our downs.—*H. Jeffery, jun. ; Ratham, Chichester, August 12, 1867.*

[The fly is *Tachina Puparum*, and its parasitic economy has long been known to naturalists. The series sent by Mr. Jeffery is very acceptable, and beautifully illustrates the life-history of the fly.—*E. Newman.*]

Are two Species confused under the name of Cerura vinula? — I have frequently called the attention of Entomologists to the great difference which obtains between the antennæ of different individuals of both male and female puss-moth; in some the pectinations are fully twice as long as in others. The late Mr. Stephens always entertained the idea that we had two species, but he failed to point out characters that have satisfied subsequent observers; he, moreover, was unfortunate in applying Hübner's name of *Erminea* to the supposed second species, which was certainly an error: if we have two species a difference will inevitably be detected in the larva.—*Edward Newman.*

Grapholitha ravulana in Darent Wood. — Dr. Knaggs records, in the 'Entomologist's Monthly Magazine' for August, the capture of this species by Mr. Meek, in June last: no description is given.

Scoparia ingrattella at Folkstone. — In the same journal the same Entomologist records the capture of *Scoparia ingrattella* at Folkstone, but he very wisely suggests a doubt whether this insect be really distinct from *Scoparia pyralella* of our cabinets, a most variable species.

Economy of Depressaria nervosa. — During the early part of June last I collected a number of the full-grown larvæ of *Depressaria nervosa*, which I placed in a breeding-cage. Some of them changed to pupæ, without cocoons, in the stems of their food-plant; but as there was not room for all, the others spun slight silken cocoons in the sand, and changed there. This appeared to me to be a curious instance of larvæ adapting themselves to circumstances, for in their

habitat I invariably find that, when full-fed, they gnaw a hole in the stem of *Ceanothe crocata*, and, crawling up the hollow until they come to a joint, suspend themselves by the anal hooks, and turn to naked pupæ there. The imago escapes through the hole which the larva had made on entering. I have found as many as twenty pupæ hanging together in a bunch from one joint. — *Henry Moncreaff; Southsea, August 14, 1867.*

Malformed Brachinus crepitans: Can Coleoptera reproduce a Leg?—Whilst searching for a pupa which I had dropped among the grass on a clay-bank near the sea in this island, I came unexpectedly upon a large number of specimens of *Brachinus crepitans*. They were in parties of from ten to twenty at the roots of the grass, mixed up with *Anchomenus prasinus*, the latter numbering two to one. I collected a considerable number, and on spreading them out this morning I found one of them to have a curious malformation of the right hind tibia. The tarsi-joint had apparently been crushed at some time of its existence, and the foot turned under; but from a small space above this another foot had grown, four joints of which are partly formed, and a corresponding spine on the other side of the leg. I send the specimen for your acceptance. Have Coleoptera the power of reproducing a lost limb, and, if so, at what period of their existence?—*Id.*

Abdera quadrifasciata in Dunham Park.—I have captured a few specimens of this scarce beetle on the dry fungus attached to a felled beech-tree in Dunham Park. Last year, when the tree was standing, I met with a single specimen.—*R. S. Edleston; Bowdon, August 14, 1867.*

The new Hop Insect.—The insect about which you write has been very plentiful this year, and has done us much injury as hop-growers. It appeared about the middle of May, and is at first a small, white, jumping insect, found on the lower shoots of the hop: here they live by day, and at night they work up the plant and riddle the leaves, also piercing the tops of the shoots, and especially those parts where blossom is about to appear; thus, when the plant has made its bine, there is almost an entire absence of blossom, very often the little "pins," as they are called, showing themselves dried up. Towards the end of June or beginning

of July these creatures change into larger ones, still jumping, but, now having wings, they often fly on the plant being shaken; they have some dark marks down the back, and congregate chiefly on the upper part of the plant: in this state I do not think they injure the plant; I have not been able to trace any kind of injury, even though there are scores on the upper leaves. It strikes me the insect is one of the Cercopidæ (? an Aphrophora), and I see in a description of *A. spumaria* that after its transformation it ceases to absorb the juices of the plant on which it lives. We hardly see one of these insects now: perhaps you can say in what state they are, and where they are likely to be found. Do you think they deposit their eggs in the hop-bine? this is very important to know. The "common cuckoo-spittle," I believe, deposits its eggs on the stems of the plant on which it lives. We have suffered greatly, both this year and last, from this pest, and anything likely to prevent its reappearing among us I should like to try. Burning the bine seems to me the most likely to effect it: what say you?—*W. T. Gunner; Alton, Hants, August 15, 1867.*

[The first notice of this new and most destructive pest appeared in the 'Entomologist' for July (Entom. iii. 302), and I am most anxious to collect and publish every scrap of information that can be gathered respecting it. My opinion, as already expressed, is that it belongs to the genus *Typhlocyba*: Mr. Gunner's description of its habits seems to establish this view. I hesitate to recommend a remedy for an evil so new to me, but the use of smoke is a very cheap and easy remedy, and it is found that all these saltatory Hemiptera have a great antipathy to smoke. I earnestly entreat my correspondents to make experiments and report the results.—*Edward Newman.*]

Catoptria aspidiscana at Morecombe Bay.—I have had a series of this species in my collection for several years, under the name of *Catoptria microgrammana*: it is not very rare, and occurs in the middle of June, in mixed herbage, at Grange, near Morecombe Bay; it also occurs in Silverdale.—*R. S. Edleston; Bowdon, August 5, 1867.*

Captures this Season.—I enclose a list of the best of my captures in May, June and July:—*Scotosia certata*, at light; *Eupithecia indigata*, at Wickham; *Platypteryx hamula*, at

light, at Dulwich; *Eurymene dolobraria*, at Croydon and Epping; *Spilodes cinctalis*, at light; *Anticlea rubidata*, at Croydon; *Scotosia rhamnata*, *Lobophora sexalata*, *Cidaria picata* and *Botys hyalinalis*, at Faversham; *Boarmia abietaria*, *Lithosia unita*, *L. deplana* and *Aventia flexula*, at Mickleham; *Lithosia complana*, *Acidalia inornata*, *A. straminata*, *Pachycnemidia hippocastanaria*, *Eupithecia minutata* and *Halias Quercana*, at Shirley; *Boarmia perfumaria* and *Thecla Betulæ*, bred; *Pelurga comitata*, *Pylalis fimbrialis* (abundant), *P. glaucinalis*, *Geometra papilionaria*, *Eupithecia subnotata*, &c., at light. Late in July I found a female *Hepialus Humuli* on a gas-lamp, being the first specimen of the genus I have observed attracted by light. — *J. P. Barrett*; 29, Radnor Street, Peckham, August 15, 1867.

How many Broods are there of Campptogramma fluviala? — During the present year I have taken this insect at the lamps here as follows: — June 11th, a worn specimen; July 23rd and 25th, two specimens; August 3rd, two specimens. Last season I met with it in September and October. — *Id.*

Gall of Salix herbacea. — Enclosed is a little gall, which from its location may be curious; and if you know any Entomologist who has studied galls you would confer an obligation if you could get me the name of the fabricator of this. When on Ben Lawers, in Perthshire, last week, in searching for mosses, I noticed a little slope near a marsh, on which a number of a small red fruit (as I at first thought) were apparent, and supposed it might be a little *Vaccinium*; but to my surprise, on gathering the seeming fruit, it proved to be a red gall, distorting the leaves of *Salix herbacea*. What is curious in the gall is its size in proportion to the little prostrate *Salix* on which it is dependent for its nourishment, and the simulation of little berries that it presents to the eye upon the sloping side of the mountain, where the *Salix* creeps to a considerable extent, so that there seemed to the eye a numerous crop of red berries on the ground amongst the moss. The height of the slope on which the *Salix* was located on Ben Lawers could be little less than 3000 feet. — *Edwin Lees*; Green Hill Summit, Worcester, August 1, 1867.

[Immediately on receiving these beautiful little galls I despatched them to Mr. Armistead, now staying at Allonby,

in Cumberland: from his kind and prompt reply I have made the following extract, which I am sure will be read with pleasure.—*Edward Newman.*]

“Thanks for the *Salix herbacea* with gall on it, by no means new, though not frequently met with, inasmuch as the plant itself is very local. I have specimens from Skiddaw and some of our hills, also from Norway; and my son brought me some from the Orkneys last year. I regret I have not had an opportunity of verifying its originator. You are quite correct as to the willow-galls not being produced by Cynipidæ. Indeed, as regards galls generally, they appear for the most part to be the works of Cecidomidæ. Probably the plant-lice (*Aphis* and *Psylla* families) produce as many as Cynipidæ. Some moths are now known to make galls. My friend Benjamin Walsh, of Illinois, to whom I am indebted for specimens or descriptions of many of the North-American galls, informs me he has discovered one on a shrub (*Amorpha fruticosa*), made by a small Tinieide. He said he would send me a specimen of the gall, also the moth, which, he adds, “is a very pretty one:” these have not yet come to hand. I have found, on a small willow here, a gall much more resembling a cranberry than that on *Salix herbacea*. I send you a few by post, just gathered, growing amongst the cranberries, a few of which I had for comparison. These galls are now only greenish, but later on they become quite red, like little drops of sealing-wax, not like those of the burnet rose, which are rougher skinned. The latter are exceedingly abundant here and very pretty. I put some in, with a few on *Thymus Serpyllum*, and two on *Achillæa ptarmica*, not unfrequent here. There are also very pretty ones on *Geranium sanguineum*, abundant here: these tufts are formed of narrow leaflets, with the margins reddish and rather turned in. They shrivel up a little when dried and lose their beauty, but if slightly pressed they preserve somewhat of their character. I am going to try them in heated sand, which answers tolerably well for some galls, as the bedguar of rose, the great drawback being in their becoming brittle. Some preserve best in brine: I have received in this succulent ones from America and Switzerland; but these are skeletons when compared with Nature’s beautiful originals.”

THE ENTOMOLOGIST.

No. 46.]

OCTOBER, MDCCCLXVII.

[PRICE 6D.

On Rearing the Yama-mai Silkworm.

By GEORGE GASCOYNE, Esq.

PERMIT me the use of your columns to make a few remarks on the rearing of the larva of the oak-feeding silkworm, Yama-mai. I have found it so easy to manage that, with such an abundance of its food-plant on every hand, there seems no reason why it should not be extensively and profitably cultivated in this country.

Those of your readers who have perused Dr. Wallace's exact and painstaking prize-essay on the Yama-mai, published in the Entomological Society's 'Transactions,' must have arisen from its perusal with but small hope of its ever becoming productive in England; at least such would have been my own conclusion, had not a general experience in larva-rearing convinced me that the mode of proceeding detailed therein was just such as to induce the disease of which all the larvæ died. Dr. Wallace has so faithfully noted his experiments, and those of others in this country, as to enable us at once to lay hand on the causes of failure; the larvæ have in fact been "killed with kindness:" the almost incessant supply of water has mainly tended to this result. I am convinced that neither *Notodonta trepida*, *Endromis versicolor*, nor other large and robust larvæ, could be reared under such treatment.

For the information of those who have not seen Dr. Wallace's Essay, I may mention that all attempts in this country to get the larvæ into pupæ had practically failed to the date of the publication of the Essay; and the Doctor informs me, in a letter lately received, that those he is now feeding are fast dying off. Under different treatment my larvæ have already spun up, without a single instance of disease or the slightest check. Fifteen eggs hatched; one of the young larvæ disappeared the day following, and two others, at a

later period, injured each other and died, leaving twelve to proceed with. From the time of hatching to spinning up these larvæ were never handled: they were fed on young oaks, and, when these were cleared, bushy branches of well-matured foliage (not tender, recently-developed leaves) were stuck into saturated sand, in eight or ten-inch pots, which was daily supplied with as much water as it would absorb without standing in pools on the surface: cut food thus treated will remain in good condition two or three days, even in a high temperature. I attribute success mainly to the following precautions:—Non-interference with the larvæ; a good supply of healthy, *well-matured* food; allowing them always to remain in the same room, thus avoiding a sudden change of temperature; and especially freedom from wet foliage, abstinence from water, and the supply and constant circulation of dry air at a suitable temperature; in short, to be allowed to exist, as nearly as possible, as in the natural state.

When about to spin the larvæ almost invariably selected the terminal leaves of projecting twigs among which to form their cocoons. I conclude from this that the pupæ would naturally be exposed to and require the full rays of the sun.

I cannot hide from myself that some of Dr. Wallace's remarks are foregone conclusions (I feel sure the Doctor will take this in the same candid spirit in which it is made). At page 394 of his Essay he says, "Dry hot weather is prejudicial to the larvæ;" and again, "Moisture is grateful at all times, and is necessary for their existence." In neither of these conclusions can I concur: I point to the result of my own experiment. During the nine or ten weeks which comprised the larval life of my Yama-mai water never approached them, except on two occasions, when a slight sprinkling was given from a fine rose to refresh the food, which could not at the moment be replaced. They were reared in an unheated plant-house, in a good light with plenty of sun, which did not seem to incommode them. The temperature, as a rule, varied from 65° to 75°, rarely reaching 80°. The following are the dates of the several transformations:—

Eggs hatched from April 25th to May 1st

First moult from May 7th to May 12th

Second moult from May 18th to May 24th

Third moult from June 2nd to June 9th

Fourth moult from June 13th to June 20th

Spun cocoons from July 3rd to July 13th.

It would be interesting to know the mode of treatment this larva during the present summer by others in this country.

GEORGE GASCOYNE.

Newark, August, 1867.

P.S. — As my remarks on the larva of the Yama-mai (silkworm) have not appeared in the September issue of the 'Entomologist,' it gives the opportunity of adding the final result of this experiment.

Since I last wrote the twelve cocoons have produced the same number of the perfect insect, namely, six males and six females; the first emerged on August 20th, the last on the 30th; ten appeared between six o'clock and half-past seven in the evening; the two others at half-past four and eleven P.M. respectively. Coition took place in four instances, and the produce has been 300 fertilized eggs, only about half the moths possessed: this limited supply I attribute to the confined space allotted to them, as I have found, in former experiments with large Lepidoptera, that they will not freely part with their eggs without the opportunity of an occasional flight during the process. The whole of the moths were fully developed, and expanded themselves perfectly. The ground-colouring varies much in the different individuals; in four it is yellow, five fawn or salmon, and the remaining three dun. These colours are borne indifferently by males and females. The expansion of the largest is six and three-quarters and the smallest five and a half inches, the males being as a rule the largest, and the tips of their fore wings more hooked than those of the females: the antennæ of the males are much pectinated, reminding one of those of the British moth, *Ptilophora plumigera*.

G. GASCOYNE.

September 6, 1867.

A Revision of the Characters and Synonymes of British Bees. By FREDERICK SMITH, Esq.

(Continued from page 325).

Genus SPHECODES, Latr.

1. SPHECODES GIBBUS.

Sphex gibba, Linn. *Faun. Suec.* 413, female; *Syst. Nat.* i. 946; *Rossi. Faun. Etrus.* ii. 63.

Melitta sphecoides, Kirby, *Mon. Ap. Angl.* ii. 46, female.

M. monilicornis, *Id.* 47, male.

M. picea, *Id.* 48, male.

Sphecodes sphecoides, Smith, *Zool.* iii. 1013, male, female.

Sphecodes gibbus, Nyland. *Ap. Boreal.* 193; *Smith, Bees Great Brit.* 16; *Schenck, Bees Nassau*, 302; *Sichel, Ann. Soc. Ent. Fr.* (1865), 413.

Sphecodes subovalis, *Schenck, Bees Nassau*, 303.

The typical specimens of Kirby's 'Monographia' being now in the British Museum, I have again carefully examined them; I have also re-examined the Linnean and Fabrician specimens; I possess specimens from Drs. Sichel, Nylander and Schenck: these circumstances enable me to speak with more confidence than I otherwise could. The synonyma given is restricted to that upon which I feel I can rely. This species is generally distributed, and is very abundant throughout Europe. I have on several occasions detected this bee in the act of burrowing in the ground: it is very frequently taken plentifully on the flowers of the ragwort, and also on thistles.

2. SPHECODES RUFIVENTRIS.

Nomada gibba, *Fabr. Syst. Piez.* 393, and *Cab. Mus. Dom. Banks.*

Tiphia rufiventris, *Panz. Faun. Germ.* 53, 4, female.

Melitta gibba, Kirby, *Mon. Ap. Angl.* ii. 42, female, male.

Dichroa analis, *Illig. Mag.* v. 48; *Eversm. Hym. Volgo-Uraleus*, 48.

Sphecodes rufiventris, *Wesm. Obs. Gen. Sphec.* 8; *Sichel, Mon. Gen. Sphec.*; *Schenck, Bees Nassau*, 302.

S. rufescens, *Smith, Bees Great Brit.* 17.

S. pellucidus, *Smith, Zool.* iii. 1014.

This is certainly the *Nomada gibba* of Fabricius, the *S.*

rufiventris of Wesmael and Sichel, and most probably the *Tiphia rufiventris* of Panzer. I have therefore adopted the latter name for the species. Kirby describes the antennæ of the male of this species as "submoniliformes, thorace breviores:" this is a character that distinguishes from the male of the true *S. gibbus*, which he has described under the names of "moniliformis and picea," in which the same organs are described "thoracis longitudine, articulis arcuatis." The species is equally common as the preceding, and frequents the same flowers.

3. SPHECODES SUBQUADRATUS.

Sphcodes gibbus, *Wesm. Obs. Gen. Spec.* 5.

S. subquadratus, *Smith, Zool.* iii. 1014; *Bees Great Brit.* 18; *Nyland. Revis. Ap. Boreal.* 235; *Schenck, Bees Nassau*; *Sichel, Mon. Gen. Spec.* 414.

This species was first taken by Dr. Thwaites, near Bristol; subsequently I discovered a colony near London; in 1865 I again, after an interval of sixteen years, found it plentifully at Birch Wood, Kent. The quadrate form of the head will serve to distinguish it from the other species. The males very closely resemble those of *S. gibbus*, but their heads are not so wide in proportion to the thorax, which is much more closely punctured, as is also the head; the antennæ are proportionably shorter, and the wings not so darkly clouded.

4. SPHECODES EPHIPPIUS.

Sphex ephippia, *Linn. Faun. Suec.* 944; *Syst. Nat.* i. 944, and *Cab. Mus. Linn. Soc.*, male.

Melitta divisa, male, and *M. Geoffrella*, female, *Kirby, Mon. Ap. Angl.* 49 and 45.

Apicis minimus, *Harris, Expos. Engl. Ins.* 136, t. 39.

Sphcodes maculatus, *St. Farg. Hym.* ii. 545, male.

S. Geoffrellus, *St. Farg. Hym.* ii. 544; *Wesm. Obs. Gen. Spec.* 7; *Smith, Zool.* iii. 1014; *Nyland. Revis. Ap. Boreal.* 194.

S. ephippius, *Smith, Bees Great Brit.* 19; *Schenck, Bees Nassau.*

This small insect has the head of the same form as that of *S. subquadrata*; the examples of the males therefore closely resemble those of *S. subquadratus*, but size alone will usually

serve to distinguish them; then again they have usually all the tarsi pale, and frequently the legs entirely so; the margins of the abdominal segments are bordered with a black line; the joints of the antennæ are not so decidedly moniliform, and the apical half of the mandibles is usually pale rufescent. In my work on the 'Bees of Great Britain' I quoted *Andrena Potentillæ* as synonymous; this was an error, which my friend Dr. Sichel has corrected: Panzer's insect is undoubtedly the male of *Andrena analis*. I cannot regard *S. hispanica*, with Dr. Sichel, as the same as our insect: I have received a series of that species from Algeria, and consider it quite distinct. Dr. Sichel has drawn attention to the diagnosis of the Linnean *Sphex ephippia*, "*Atra, fronte cærulescente, abdomine fascia ferruginea duplicata.*" I have again re-examined the typical specimen in the Linnean cabinet, and can vouch for the head being entirely black. The error is obvious: "*cærulescente*" should have been "*pubescente*,"—an error doubtless of the press. Some doubt having been expressed of the propriety of adopting the Linnean name, I give this explanation of the circumstance; and I would also refer to the full and correct description by Linneus, in these terms, "*Fronte pilosa, ex albo micans.*" This elucidation will, I trust, remove all doubt on the subject.

5. SPHECODES FUSCIPENNIS.

Dichroa fuscipennis, *Germ. Faun. Ins. Europe*, fas. 5, t. 18.

Sphcodes Latreillii, *Wesm. Obs. Gen. Sphex*. 8; *Nyland. Revis. Ap. Boreal*. 254.

S. nigripes, *St. Farg. Hym.* ii. 542; *Lucas, Explo. Sc. Alger.* iii. 222.

S. rugosa, *Smith, Zool.* vi. 2208.

S. fuscipennis, *Smith, Bees Great Brit.* 20; *Schenck, Bees Nassau*, 306.

This species is included with some degree of doubt. There are two specimens in the British Museum, believed to have been taken in Devonshire by Dr. Leach, and I possess two said to have been captured near Bideford.

FREDERICK SMITH.

Description of the Larva of Colias Edusa. — Rests in a nearly straight position, but with the anterior segments slightly raised, and the head slightly bent under Sphinx-like; when annoyed it falls from the food-plant and forms a complete ring: the head and body are of nearly uniform width, the body cylindrical, the thoracic segments somewhat incrassated, the terminal segments somewhat attenuated; the crown is gibbous and without a notch; the head is covered with minute warts, and each wart emits a short hair; the segmental divisions are indistinct and transversely wrinkled, the wrinkles dividing each segment into narrow sections, each section composed of a series of minute warts, and every wart emitting a short hair: in form and habit this larva very much resembles that of *Pieris Rapæ*. The colour of the head and body is grass-green, the minute warts being black and each surrounded by a whitish ring: there is a very distinct but rather narrow whitish stripe along each side, comprising the spiracles, which are yellowish; it commences on the 2nd and terminates on the 12th segment. It feeds on *Trifolium repens* (Dutch clover), and is full-fed at the end of July. I am indebted to Mr. Buckler, of Lunley, for the opportunity of describing this larva, the long-continued difficulty of procuring which has rendered its existence almost mythical.—*Edward Newman.*

Description of the Larva of Selenia tiliaria. — The eggs of this moth are laid side by side on the bark of the beech-twigs. The caterpillar is full-fed during the first or second week in July, when it rests in a straight position, and has a remarkably stick-like appearance; the head is porrected on the same plane as the body, the face is widest at the mouth, and the head is altogether wider than the 2nd segment; the thoracic segments are attenuated; the 6th and 9th have transverse dorsal ridges, that on the 6th extending to the sides, that on the 9th being dorsal only; the 7th segment is inflated below, the inflation extending to the sides, and being ventrally divided into a transverse series of four warts; the 12th has two small warts, and the 13th terminates below the anal flap in two nipple-shaped processes directed backwards, each nipple bearing at the extremity a single bristle; the anal claspers are large and spreading; the third pair of feet are seated on a marked ventral protuberance, and each

pair is distant from the next; all the legs are sickle-shaped. The colour of both head and body is exactly like that of the birch-twigs on which the caterpillar rests; the dorsal area is thickly, the ventral sparsely, irrorated with white; each segment has a pair of dorsal white spots placed transversely; the warts on the 12th segment are black. The caterpillar I have described spun a tolerably compact but altogether shapeless cocoon among the leaves of the birch, and on the third day changed to a pupa of a creamy white colour; it has a short sharp keel or ridge behind the head; the abdomen is rather long, and tapers gradually to a point furnished with a few small hooks, by which it is suspended in the interior of its web. I am indebted to Mrs. Hutchinson, of Grantsfield, for the larva described.—*Edward Newman.*

Description of the Larva of Boarmia rhomboidaria.—The eggs are generally laid in July, on privet, elder, or some other shrub or tree, those of low growth being preferred: the young larvæ emerge at the end of July or during August, and grow slowly: at the approach of winter they are scarcely more than half an inch in length, and then cease to eat and retire for hybernation: during part of the following May and June they feed freely, and are soon full-fed. The larva then rests in a straight stick-like position, with the head prone and the feet crowded together and directed forwards, so that the head, anterior segments and feet seem to form one mass; sometimes, however, the feet are extended, and clasp a twig of the food-plant. The head is slightly narrower than the 2nd segment, the face extremely flat, and the crown prominent and slightly notched in the middle; there are a few very obvious bristles about the mouth; the body is of uniform thickness throughout, and has a very manifest undulating lateral skinfold; the body terminates beneath the anal flap in three short points, of which the middle one is slender and acute, the outer ones stouter and obtuse; on various parts of the body are short and slender bristles: the colour of the head is dark umber-brown, the face approaching to black, the crown paler, the palest part of all being the ridge where the crown and facial disk unite; the body is rich umber-brown, exhibiting traces of three slender white dorsal stripes, of which the medio-dorsal is straight, and bordered, especially on the 2nd and 3rd segments, with black; the anterior

margin of the 2nd segment is also black; the lateral white stripes are waved, and all three are interrupted at intervals and broken up into dots; there is a pale and tolerably broad medio-ventral stripe, delicately bordered on both sides with pure white; on each side of this is a similar stripe, rather indicated than expressed; between the ventral and anal claspers the ventral surface is pale. I am indebted to Mr. Barrett and Mr. Wright for a supply of this larva. The moth is certainly the *B. rhomboidaria* of Guenée, while *B. rhomboidaria* of Stephens is as certainly my *B. perfumaria*, the larva of which is previously described in the 'Entomologist:' whether these two insects be considered identical or distinct is immaterial, since it indicates rather the character of the entomologist than of the insect: the ablest, most fluent and most controversial writers occupy firm ground in contending that the two are identical, whilst those close and patient observers, who reluctantly and diffidently express their views in print, uniformly regard them as distinct.—*Edward Newman.*

Description of the Larva of Fidonia atomaria.—Feeds on *Rubus fruticosus* (bramble), and was full-fed on the 17th of July: it rests in a nearly straight position, with the head prone and slightly exerted; it is of nearly the same width as the 2nd segment; the crown gibbose and slightly notched: the body is almost uniformly cylindrical, with a manifest lateral skinfold. The face has a slight resemblance to the human face, the central plate (or nose) being very distinct, but very flat; on the upper part of each cheek is a pale patch, in which is a dark eye-like spot, and above this is a dark crescentic mark much resembling an eyebrow. Colour of the body umber-brown of two shades, arranged in longitudinal stripes; medio-dorsal stripe broad and pale, intersected throughout by a pair of very delicate slender indistinct darker lines; on each side of the medio-dorsal stripe is a narrower dark stripe, exterior to which is a pale stripe of the same width; and between these, partially on each, is a series of small white spots, one on the posterior margin of each segment; a broad dark stripe succeeds, and then a broadish pale stripe, which comprises the skinfold and spiracles; ventral surface pale brown, with two distinct broadish dark stripes, which extend from the third pair of legs to the ventral

claspers; the anal flap terminates in one, and the 13th segment in two, nipple-shaped points directed backwards; and there are a number of bristles on the head and on various parts of the body. I am indebted to Mr. Moncreaff for a supply of this larva.—*Edward Newman.*

Description of the Larva of Xanthia gilvago.—Head very decidedly narrower than the 2nd segment, porrected in crawling, not notched on the crown; 2nd segment smaller and narrower than the following; the body smooth, almost uniformly cylindrical, but very gradually increasing to the 12th segment, which is the largest, velvety, the segmental divisions very clearly marked; anal claspers small, closely approximate, not spreading; head umber-brown, clouded, paler brown on the cheeks, very glabrous; dorsal area of the body dingy brown, the 2nd segment having a semicircular patch of darker brown, the convex margin of which is directed backwards, and the disk of which is interrupted by three pale longitudinal lines, with an intervening pale spot on the convex margin; between each two there is a dorsal series of subtriangular markings, all darker than the ground-colour, the apex of each pointing backward; the ventral area is paler than the dorsal, and slightly tinged with olive-green, the division between the dorsal and ventral areas being abruptly marked, and at the region of the spiracles, which are intensely black, the dorsal area and triangle are varied with linear markings, which disappear towards the period of pupation. I am indebted to Mr. Baker, of Derby, for a supply of this larva.—*Id.*

Entomological Notes and Captures.

A Proctotrupes Parasitic on a Myriapod.—About a fortnight ago the Rev. J. L. L. Fulford most kindly sent me a specimen of *Lithobius forficatus*, one of the *Scolopendra* family, not uncommonly found under stones, in greenhouses, cucumber-frames, and many similar situations. The peculiarity in this specimen, to which Mr. Fulford particularly invited my attention, was this,—there were attached to the ventral surface of the body, issuing from between the segments, certain pupæ of an ichneumonideous parasite. On

examining these attentively I found them fourteen in number, and all adhering tenaciously to the body of the *Lithobius* by means of the extremity of the abdomen: it seems as though each had endeavoured to wriggle out of the living domicile which it had been inhabiting without the consent of the landlord, and had been suddenly arrested in its departure, and held fast by the tail, after its head and shoulders, body and wings, had fully emerged into open daylight. The pupæ were perfectly naked, without cocoon or covering of any kind, and exposed in a manner that admitted, nay more, that seemed to invite, investigation: they all protruded from the body of the victim in one direction and at an angle of 35 or 40 degrees; their backs were outwards, their faces towards the ventral surface of the *Lithobius*, the legs of which seemed to have assumed the *rigor mortis* in a futile attempt to clasp this large family of unnatural offspring. The colour of these creatures was ivory-white, contrasting strongly with the rich ferruginous colour of the myriapod; the eyes alone were mahogany-brown, and there was a tendency to transparency about the antenna-cases, the leg-cases and the wing-cases. The appearance of this little company was very strange to me; their exact uniformity of position, their equally exact correspondence in size and form, the conspicuously contrasted colour of their eyes,—all this, enhanced as it was by my utter ignorance of the existence of a parasite on *Myriapoda*, combined to render this sight one of peculiar interest. When I had satisfied my first curiosity, I gently laid the defunct *Lithobius* on damp blotting-paper, covered him with a small counterpane of the same material, and deposited him in a tin box, thus ensuring the delicate *Ichneumons* against such an excess of drought or heat as might possibly interfere with their progress to maturity. Oftener than the day I examined my precious charge, and on the 26th of August I found that the twenty-eight eyes were changing from brown to black; some of them were already black: this was a tolerably certain sign that the *Ichneumons* were still living: on the 27th black was appearing partially suffused over the thorax and body; the next day black became the predominant colour; on the 29th a red leg was liberated from its swathing envelope, and waved itself lazily in the air for a moment, then subsiding

into inaction, like a flag that responds to a gentle puff of wind on a still day, and then suddenly droops, to cling motionless to the flagstaff of which it apparently forms a part; on the 2nd of September three Ichneumons were liberated, and one of them, having been most kindly examined by Mr. Walker, is pronounced to be *Proctotrupes Calcar* of Haliday. I believe this is the only instance in which an Ichneumon has been proved to be parasitic on a Myriapod; but I trust that my friend Walker, so renowned for his investigation of parasites, will favour us with his experience in a future number of the 'Entomologist.'—*Edward Newman*. P.S.—Mr. Fulford informs me the original number of pupæ was twenty-one.—*E. N.*

Abundance of Colias Edusa near Laleham.—How can you account for the great numbers of *Colias Edusa* that have been seen this year in this neighbourhood?—*A. Joyner; Deal House, Laleham, near Chertsey.*

[I must leave this question to my readers: I have no solution to offer.—*E. Newman.*]

Larvæ of Polyommatus Artaxerxes.—I have just failed in an attempt to rear *P. Artaxerxes* from the egg, the young larvæ having damped off. The only additional observation I can add to their life-history is that they preferred the leaves of the scarlet geranium to those of the *Helianthemum*, which not one would touch. The larvæ were very delicate, of a semi-transparent white colour, with a black head, and had numerous long white hairs. The eggs were circular, flattened, covered with small granulations, except at the apex, and were of a greenish white colour: they hatched in fourteen days.—*Andrew Wilson; 21, Young Street, Edinburgh, August 19, 1867.*

Eupithecia pulchellata at Edinburgh.—This *Eupithecia*, rather rare here as an imago, is turning out rather commonly as larvæ, just as Mr. Crewe anticipated.—*Id.*

Acherontia Atropos near Leeds.—Not having seen any record this season of the appearance of *A. Atropos*, I wish to inform you that I had brought me on the 12th of this month a fine male specimen, in splendid condition, captured here.—*William Liversidge; 35, Stansfield Row, Burley, Leeds, September 14, 1867.*

Chærocampa Celerio at Ipswich.—On the 28th of August,

Mr. Edward Florrex, of this town, captured a fine specimen of *Chærocampa Celerio*: it was at rest on the door of the engine-room in the entrance-yard at the Orwell Works of Messrs. Ransome & Sims, of this town, at six o'clock in the afternoon.—*G. Garrett*; 172, *Woodbridge Road, Ipswich, September 8, 1867.*

Food-plants of the larger Nocturni.—On the 31st of August I found a nearly full-grown larva of *Smerinthus Populi* on a rose-bush in a wood, with none of its reputed food-plants very near. This seems to afford another proof of the wide range of food of many of the larger Nocturni. The names of this and several other species seem very anomalous, when it is found that they eat a large number of other plants beside that from which they are named. *Sphinx Ligustri* has the credit of eating lilac, ash, mountain-ash, *lauristinus* and holly, besides its original privet. *Smerinthus ocellatus* will eat poplar, willow, sallow, and any bushes or trees of the order Rosaceæ; *S. Populi* apparently the same, with the addition of birch, laurel and *lauristinus*; while *Acherontia Atropos* seems almost polyphagous.—*J. Merrin*; *Gloucester, September, 1867.*

[It may be added that *Smerinthus ocellatus* feeds very commonly on apple-trees in gardens.—*E. Newman.*]

Beautiful Caterpillar of Smerinthus Populi.—I have by this post sent you a peculiarly marked larva of *S. Populi*, thinking it may not have come under your notice before. I had one last year, but not quite so many spots on it. I found it feeding on poplar.—*G. C. Bignell*; 8, *Clarence Place, Stonehouse, Plymouth, August 26, 1867.*

[In this very beautiful variety there are two longitudinal lateral series of delicately pink blotches; the first series is what might be called subdorsal, being visible from above looking down on the dorsal area; the second series is spiracular, each spiracle being seated in the middle of a blotch. The ground colour is pale glaucous, so that the blotches are thrown up as it were in a very beautiful manner.—*Edward Newman.*]

Mortality amongst Larvæ of Eriogaster lanestris.—In the early part of this season I received a large number of larvæ of *E. lanestris* from correspondents in the South; these I placed together in a large breeding-cage, and supplied them

abundantly with hawthorn. They fed up well, but just when they appeared ready for spinning up they began to die off in scores. I thought the cold weather we had at that time might be the cause of this; I therefore removed most of what I had left to a warm room; this, however, was of no use, as they died off as fast as ever, and out of about 130 larvæ I have only a single cocoon. If you or any of your readers can explain the cause of this I shall be greatly obliged.—*George T. Porritt; Huddersfield.*—‘*Naturalist’s Circular.*’

Demas Coryli near *Plymouth*.—I had the pleasure of taking four larvæ of *Demas Coryli* on the 20th of June; the first changed to pupa on the 30th, and the first imago appeared on the 25th of July, and a second on the 30th. Is not this an unusual time?—*G. C. Bignell.*

Lithosia complana in *Ireland*.—Mr. Birchall has just shown me a beautiful specimen of *Lithosia complana*, bred from a larva found by himself in Ireland, and supposed to be that of *L. caniola*.—*Edward Newman.*

Saturnia Carpini.—I found a caterpillar on the moor to-day which neither of my gamekeepers have ever seen before: it is about two inches long, and the colour a very bright green; the body has thirteen rings, and each ring has several spots, like buds of the heather, on which it was feeding; each spot has a few short bristles.—*A. D. Kerswell; near Lanark.*

[The caterpillar is that of the Emperor moth (*Saturnia Carpini*).—*E. Newman.*]

Does Saturnia Carpini often stay in Pupa two Winters?—A whole brood I reared last summer, from eggs sent to me from Yorkshire, is still in pupa, while a larva found in Kent produced an imago last May.—*J. P. Barrett; 29, Radnor Street, Peckham, August 15, 1867.*

Is Minoa Euphorbiata double-brooded?—Towards the end of May I took several specimens of this moth. In June those taken were much paler, being apparently slightly faded. On the 31st of August, in the same locality, I took a single specimen, apparently quite fresh. Is this species double-brooded?—*J. Merrin; Gloucester.*

Acidalia interjectaria at *Plumstead*.—Mr. H. Vaughan announces, in the ‘*Entomologist’s Monthly Magazine*,’ that

he has taken this new geometer at Plumstead: its discovery and identification were first announced in the 'Entomologist,' a few months back, by Mr. Doubleday.

Sterrha Sacraria at Southsea.—Last evening (August 22), in a lane near Southsea, I captured a fresh specimen of *Sterrha Sacraria*; it was at rest on a grass-petiole, the wings being acutely roofed over the body, which gave it a curious appearance. It had apparently just left the puparium, and aired its wings. I hope to take more, as it was evidently bred in the locality. Fore wings light straw-colour, with a light pink oblique stripe; hind wings white.—*Henry Moncreaff; Southsea, August 21, 1867.* P.S.—I took a second specimen of *Sterrha Sacraria* on September 2nd.—*H. M.*

Sterrha Sacraria in Lancashire.—Returning about eleven o'clock at night through a field close by my house, after sugaring, about a fortnight ago, a moth flew to the light of the lantern. I succeeded in capturing it: it proved to be a very beautifully marked specimen of *Sterrha Sacraria*. I understand it has never been taken in this locality before.—*S. J. Capper; Huyton Park, Huyton, Lancashire, August 21, 1867.*

Sterrha Sacraria in Lancashire.—Looking over the collection of one of our local Entomologists near here a few days ago, I observed four specimens of *Sterrha Sacraria* in it, which he assured me he took himself this season; and thinking the fact of this species having been taken in Lancashire might interest some of your readers, and spur on others to work more carefully, I send note of it.—*C. S. Gregson; September 2, 1867.*

Sterrha Sacraria at Newark.—Late in the evening of August 19th a female *Sterrha Sacraria*, attracted by the light, came in at the open window of my room, and was secured in fair condition.—*George Gascoyne.*

Sterrha Sacraria at Plumstead.—On the afternoon of Saturday, the 7th of this month, I captured *Sterrha Sacraria* among some long rough grass at Plumstead.—*Charles Boden; 127, Tooley Street, Borough, September 23, 1867.*

Sterrha Sacraria in the Isle of Wight.—On Wednesday, the 14th of August, I captured a fine specimen of *Sterrha Sacraria* flying about midday, and on the 16th I captured another specimen at sugar; both are females, and I have

nine eggs from them; and I shall be glad if any of your readers can inform me of its food-plant, as I shall try and breed it.—*Henry Rogers; Freshwater, Isle of Wight, August 17, 1867.*

[The caterpillar feeds on several species of dock and chamomile, as I have stated in my 'British Moths,' p. 96, where a full description will be found.—*E. Newman.*]

Sterrrha Sacraria in the Isle of Wight.—On the 3rd of September I took a female of this species in a barley-field. While on the setting-board she laid two eggs, one of which hatched on the 14th, and the larva is at the present time looking healthy. As some specimens of this species have been taken with a *costal* stripe, will some of your correspondents kindly inform us if this is only found in the males, or has it been observed in both sexes?—*James Pristo; Alverstone, Whippingham, Isle of Wight, September 23.*

Sterrrha Sacraria in South Wales.—Mr. Llewelyn announces, in the 'Entomologist's Monthly Magazine,' that one specimen came to light at Neath on the 9th and another on the 15th of August.

Lithostege griseata bred.—On the 18th of June we reared seventeen specimens of *Lithostege griseata*, from larvæ found near Brandon, in July, 1866, feeding on *Sisymbrium Sophia*.—*T. Brown; King's Parade, Cambridge, August 24, 1867.*

[The Rev. John Hellins has most kindly sent me detailed descriptions of the larvæ of *Lithostege griseata* and *Agrophila sulphuralis*; these will appear in the November number of the 'Entomologist.'—*E. Newman.*]

Larvæ of Agrotis Segetum.—The caterpillars which I enclose are doing the most serious injury in our gardens at Deal; they are completely destroying the crops of cabbage, celery, &c.; and although boys are constantly employed to collect and destroy them, there is at present no visible diminution in their numbers. Are they the caterpillars of *Agrotis Segetum*, which you described in the 'Zoologist' for 1865, p. 9545?—*H. J. Harding; Lower Street, Deal, August 27.*

[The caterpillars sent are, I have no doubt, those of *Agrotis Segetum*; but it is right to say that another species, *A. exclamatoris*, has much the same habit and appearance.—*Edward Newman.*]

Caterpillars of Luperina cespitis and Agrotis Segetum.—

I must trouble you with two more caterpillars that are feeding on grass in the fields and on our vegetables in the gardens: the striped one has not appeared here before this year.—*John Howard.*

[The striped caterpillar is that of *Luperina cespitis*, and is reckoned by no means a common insect: pray save some, and try to rear the moths, which you will find very acceptable to the majority of Entomologists. The plain, indeed dirty-looking, caterpillar is that of *Agrotis Segetum*.—*E. N.*]

Dianthæcia cæsia in Ireland.—Among the larvæ which I took at Tramore, County Waterford, last year, there were a few very dark ones, quite different from the larvæ of *D. capsophila* or *D. capsicola*, and which changed to pupæ a few weeks afterwards. One of these emerged from the pupa state on the 7th of August: when it was set I sent it to Mr. Birchall, and I received a reply from him stating that it was *Dianthæcia cæsia*, only found last year at the Isle of Man.—*Warren Wright; Floraville, Dublin, August, 1867.*—‘*Naturalist’s Circular.*’

Dianthæcia Barrettii in Ireland.—Mr. Kirby announces, in the ‘Entomologist’s Monthly Magazine,’ the capture of six specimens on the 27th of June; they were rather worn. Is not this an Irish variety of *D. conspersa*, afflicted with melanism like the Irish *Eupithecia venosata*? All the markings are exactly in the same place; the only difference is in the shade of colour. This idea is not mine originally, but I think it quite worth entertaining.—*E. N.*

Polia nigrocincta in the Isle of Man.—A day or two since my friend Mr. Greening, of Warrington, sent me a *Noctua* to name, which he bred from a larva found by himself in the Isle of Man: it is *Polia nigrocincta* of Ochsenheimer, a species new to Britain. It is not uncommon in Hungary, the South of France, &c., and is easily distinguished from *P. flavocincta* by the following characters:—The superior wings are bluish gray thickly irrorated with black, interspersed with minute orange dots; and a narrow black band occupies the centre of the wing, extending from the costa to the inner margin. The inferior wings are white in the male, without any median line, and nearly black in the female. It is variable in size and in the intensity of the markings. I possess a fine series from France and Germany.—*Henry Doubleday; Epping, September 14, 1867.*

Heliothis peltigera in South Wales.—Mr. Llewelyn records, in the 'Entomologist's Monthly Magazine,' the capture of a specimen of *Heliothis peltigera* near the sand-hills on Port Talbot Moors, in Glamorganshire.

Larva of Lemuris typica destructive to Pear-trees.—A plague of the enclosed insects has appeared in a garden here, utterly devouring the leaves of the pear-trees. They do not cut the leaves into holes, but seemingly extract the whole juices of the fibre, leaving the leaf black and dead, looking as if scorched by fire. The insects are in countless multitudes, and appeared all at once on the 14th of August, and in twenty-four hours had rendered several trees utterly brown.—*S. Haddington.*

[The small caterpillars (which were squeezed on the leaves instead of being sent separately in a tin box) are certainly those of *Lemuris typica*, a species of night-flying moth by no means uncommon; but I was not previously aware they were so excessively destructive. The eggs are laid in patches of from twenty to sixty on the upper side of the leaf of some fruit-tree, as pear, apple or plum; and when the young caterpillars emerge they feed side by side on the upper cuticle and parenchyma of the leaf, until nothing remains but the brown and desiccated objects which my correspondent has sent.—*E. Newmun.*]

Is Phibalapteryx vitalbata double-brooded?—I obtained eggs of this species on the 12th of May; the larvæ were hatched on the 29th, and fed up simultaneously, all entering the ground on the 23rd and 24th of June. The first imago appeared on the 11th of July, and within a week I bred seven more. Since that time (now a month ago) none have appeared, and I have ten pupæ remaining, which I presume will not change this season. I should like to have the experience of others who have bred this insect.—*J. P. Barrett*; 29, Radnor Street, Peckham, August 15, 1867.

Catocala promissa near Chelsea.—This morning I was fortunate enough to capture a pair of *Catocala promissa* in splendid condition. As I believe this moth has not before been observed in this locality, I send you a notice of the fact.—*C. B. Walland*; 19, Oakley Street, Chelsea, August 21, 1867.

The Cotton Crop in Egypt: Ravages of Earias siliquana.

—A despatch forwarded by the Foreign Office from Her Majesty's Consul-General in Egypt, enclosing a letter from a scientific chemist established in that country, describing a new insect that had caused much havoc in the cotton crops of Egypt during the last two years, having been received by the Cotton Supply Association, together with a request that the case of specimens accompanying it might be submitted to scientific investigation in England, in order, if possible, to discover means to prevent in future the losses occasioned by this scourge, the following communication has been received from Professor Williamson:—"Fallowfield, Manchester, August 8th, 1867. — My dear Sir: With respect to the Egyptian insects, I have to remark that the moth which has proved so destructive to the cotton plant is the *Earias siliquana*, hitherto an extremely rare insect. Its sudden appearance over so wide an area is in itself a remarkable phenomenon. There appears to be no remedy for it but that of picking off the larvæ when in their very young state, a process that I presume is scarcely capable of being adopted on so large a scale as would be necessary in the present instance. The probability is that the plague will die out as mysteriously as it came, returning, however, from time to time, as is the case with the caterpillars which are so destructive amongst forest trees, especially amongst the oaks in spring. I have corresponded with some of our leading Entomologists on the subject, and they agree with me as to the impossibility of applying any practical remedy to the evil. Nothing remains, therefore, but for the cotton growers to persevere, hoping for the return of better days. Of course you are already aware that it is only the crops that are planted at particular seasons that are affected by the insect. — I am, my dear Sir, very sincerely yours, W. C. Williamson."

[Further particulars are desired: will some one of my correspondents endeavour to ascertain the mode in which the attack is made? and I shall be very happy to give the subject every possible attention: it is exactly one of the subjects for the discussion of which the 'Entomologist' is instituted.—*E. Newman.*]

Laburnum Caterpillars. — On the 1st of September, a warm sunny day, I observed swarms of small white larvæ hanging suspended by webs from the leaves and branches of

a young laburnum-tree in our garden. Each larva did not, in many cases, occupy a web to itself, but sometimes a dozen or more would be on the same, having the appearance of beads on a thread at unequal distances, no two so close as to touch each other. In this instance the web was always connected with the ground underneath. When one larva only occupied a web, it floated gently to and fro on the scarcely perceptible current of air beneath the tree; and there being thousands of these minute white atoms, and thousands of webs glancing in the sunshine, it formed a curious spectacle. On examining the leaves above I found they were extensively mined. I opened several, but could not detect any signs of life in them. I should be obliged if any correspondent could tell me the name of the larvæ, or if this, to me, peculiarity has been noted elsewhere. — *F. Wilkinson; High Street, Market Harborough.*

Chrysoclista Linneella in September. — On Sunday, the 8th of September, at 12.30, I was rather surprised to see some twenty or thirty specimens of this little gem flying in the sunshine, about the trunk of a lime-tree that has long been a nursery of the species: they reminded me of *Adela viridella* in the mode of flight, but it was neither so systematic nor so like a choral dance as the gambols of the *Adela*: these insects were out on Midsummer-day in profusion, but during the intervening months I had not seen a specimen. Is not the date unusual? I am willing to receive any mild rebukes for observing this sight on a Sunday, but please let them be "private," not for publication. — *Edward Newman.*

The Genera of Hübner's 'Verzeichniss.' — I entirely agree with the opinion expressed by Mr. Kirby (Entom. iii. 292) upon the so-called genera of Hübner. The characters given are generally so vague as to be worthless, and the most discordant species are often placed in the same *coitus*, while those which are closely allied are widely separated; and, in one instance at least, a VARIETY having red spots, instead of white as in the type, is placed in a separate *coitus*. — *Henry Doubleday; Epping, September 14, 1867.*

Larva of Tipula oleracea destructive to Oats. — The larvæ of the enclosed insect have done much damage to the crops of oats in this neighbourhood during the spring months. I

gathered these larvæ in May, in a field of four acres and a half, and think the damage done to the crop will be at least £15 or £16. The male came out a few days since, the female to-day. Could you suggest any remedy for them? — *W. Lister; Glaisdale, August 19, 1867.*

[The insects are certainly *Tipula oleracea*: the destructive power of these larvæ in parks and other grass-lands is very familiar to Entomologists, but this is the first time I have been made acquainted with their doing such serious injury to oats: it would be interesting to learn some particulars as to the treatment of rooks and starlings in the neighbourhood of Glaisdale, as I have never known this *Tipula* to exercise any serious injury to the crops where these two species of birds have not been persecuted almost to extermination.—*Edward Newman.*]

Captures near Reigate.—I have taken during the summer specimens of *Thecla Rubi*, *Lycæna Argiolus*, *Procris Statices* and *P. Globulariæ*, also a few *Euclidia* Mi. — *W. S. De Mattos; Brokes Lodge, Reigate, Surrey, September 19.*

A Timber-boring Insect in Australia. — A new and extraordinary insect plague is mentioned in the 'Wood's Point Leader.' It says that a small species of beetle, of a most peculiar construction, arrived in myriads at the Alpine Brewery a few days before, and set to work riddling the beer-barrels. The proboscis forms an excellent gimlet, with which the little insect penetrates the hardest wood in an incredibly short time, while the hinder portion is shaped like a shovel, and is employed in getting rid of the sawdust. They make clean holes through the staves, and some of the full barrels are leaking in fifty places. In a wine-cellar thousands burrow into the wine and spirit casks. As soon as they get nearly through the wood the liquor begins to ooze out, and the animal of course gets killed. Every description of box or barrel is full of them, also the doors and timber in the building. Almost every store in the township is infested with these mischievous insects. The head is red, with a proboscis somewhat resembling a parrot's bill; and the body is like a small black glass bugle broken off at the end; the whole length one-quarter of an inch.

[Doubtless a member of the family *Bostricidæ*, perhaps a true *Bostrichus*. A correspondent asks the name, but

I cannot give it from so vague a definition. — *Edward Newman.*]

Chærocampa Celerio in the Isle of Wight. — On the evening of the 21st of this month a moth was observed flying with great rapidity about the lamps in a shop in this town, and from the description given me of it by one of my sons I felt convinced that it must be *C. Celerio*; and thinking it very probable that the insect had passed the night in the shop, I directed him to search the walls and crevices, in the hope of finding it at rest. He did so, and in a few minutes returned with a living *Celerio* in perfect condition. As this insect is especially attracted by light, and yet is difficult to be caught on the wing, I would recommend that search be made for it in the day time in those spots where light has been exhibited the night before. — *William M. Frost; Belle Vue, Sandown, Isle of Wight, September 24, 1867.*

Coleophora albicans near Warrington. — I send you seven cases of *Coleophora albicans*; they have never been found in England before: the larvæ feed on the common mugwort (*Artemisia vulgaris*), and are most difficult to find: I could only find them on two or three plants where hundreds grew together: I hope you will succeed in breeding them. — *Noah Greening; Warrington, September 23, 1867.*

Ennomos alniaria at Deal. — I have taken a fine male of this species, just out of the pupa, on my back gate. The larva is said to feed on willow and alder, neither of which grow about the gardens at the back of my house. I have looked several times every day since the capture, but could not find another. — *H. J. Harding; 131, Lower Street, Deal.*

Captures at Deal. — *Colias Edusa* and *C. Hyale* have occurred here in some numbers: *Agrotis saucia* and *Aporophila australis* come freely to sugar: I have taken a good many *Lithosia pygmæola* and *Pterophorus Leinigiannus*. — *Id.*

Sesia myopæformis. — The larva obligingly conveyed to me by Mr. Bryant is that of *Sesia myopæformis*: the habitat is the usual one: I recommend that the trees be let alone: the beautiful little moths which produce these larvæ are never very numerous. I have often tried Gishurst's Compound, and found it quite efficacious in preventing larvæ from eating either the leaves or bark of trees: the weaker the solution the better. — *E. Newman.*

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NOVEMBER, MDCCCLXVII.

[PRICE 6D.

Description of the Larva of Ephyra porata. — The full-fed larva rests with the claspers only attached, the anterior extremity being held quite free, and the back forming a very decided arch; the head is prone, slightly broader than the 2nd segment; the body is slender, cylindrical and slightly rugose; the rugosity arises from the segments being divided transversely into narrow sections, which emit small bristles from minute warts. There are two varieties in colour; the more common colour is isabelline or fawn-colour, with a concolorous head; the less common colour is pale apple-green, with a reddish head; the fawn-coloured specimens have the head delicately reticulated with umber-brown; the dorsal area of the body has five or seven dotted white rivulet lines, very inconspicuous unless under a lens of high power; on each segment are four dark brown dots, forming a square; and on the side of each segment, particularly observable from the 5th to the 10th, is an oblique dark mark, broad at the anterior extremity, but gradually narrowed as it proceeds downwards and backwards; the ventral area is paler, with several dark markings, particularly on the 9th segment; the legs and claspers are concolorous with the body. When full-fed the larva spins a silken band, attached to the food-plant on both sides of the body, and, supported by this, it changes to a singularly shaped pupa, the anterior extremity being truncate, the posterior very acute: this change, in my specimens, kindly supplied by Mr. Moncreaff, took place at the end of September.—*Eward Newman.*

Description of the Larva of Pachynemia hippocastanaria. — Rests in a straight and stick-like position, with the claspers attached to its food-plant, and the rest of its body porrected; it so exactly resembles the twigs of the ling in size and colour that it is impossible for the uneducated eye to detect it; the head is semi-prone, wider than the 2nd segment, and not notched on the crown; the 2nd segment of the

body is dilated in front to receive the head; the body is otherwise almost uniformly cylindrical; it is wrinkled transversely, has an interrupted lateral skinfold, and is garnished with sprinkled bristles. The colour of the head is pale semi-pellucid brown, irrorated with black dots, most of which are arranged in an ill-defined stripe on the middle of each cheek: the colour of the body is gray-brown, with numerous black dots, which form very irregular and interrupted rivulet lines down the back; there are also six series of small blotches, of a rich mahogany-brown, like the nut of the horse-chestnut when recently exposed; two of these are dorsal, one (on each side) lateral, and two ventral; there are also on the ventral area, between each pair of chestnut blotches, two closely approximate black streaks; these streaks are connected in double pairs, thus forming two interrupted approximate ventral series; the legs are pale pellucid brown, sprinkled with black dots; the ventral claspers are gray dotted with black, the anal claspers of the same colour, with a whitish exterior streak. This larva feeds on *Calluna vulgaris* (the common ling). I am indebted to Mr. Wellman for a liberal supply of these larvæ, which were full-fed the second week in October.—*Edward Newman*.

Description of the Larva of Melanthia ocellata.—The eggs are laid on lady's bedstraw (*Galium verum*), in June, and the larva is full-fed by the middle of July, when it rests in a somewhat bent position on its food-plant; the head is porrected, the back slightly arched, and the legs directed forwards; on being annoyed the head is altered into a prone position and bent under, the back increasingly arched, and the caterpillar falls to the ground as though lifeless, and frequently remains as much as an hour perfectly motionless: the head is about the same width as the 2nd segment, perhaps rather narrower, and there is no apparent notch on the crown; the body is almost uniformly cylindrical, but slightly increases in size towards the anal extremity; it is wrinkled transversely, and has numerous small warts, each of which is surmounted by a bristle. The colour of the head and body is yellowish brown, with a slight tinge of olive-green; the head has three parallel longitudinal stripes almost white, and the spaces between them are dotted with darker brown; the body has numerous and very distinct white

markings; there is a pair of white and closely approximate medio-dorsal stripes on the 2nd, 3rd and 4th segments; and the slender darker stripe which separates these is continued to the anal extremity, passing through the points of five very distinct white V-shaped markings, whose points are directed backwards; these V's are bordered by a darker ground colour, which renders them very conspicuous; the dorsal area is bordered by a very distinct white stripe, which, commencing at the mouth, extends to the extremity of the anal claspers, emits a branch into the ventral claspers, and touches, but does not include, the jet-black spiracles; the ventral is paler than the dorsal area, but is thickly sprinkled with yellow-brown dots, some of which form a narrow medio-ventral stripe, while others form oblique lines, one on each segment. About the 20th, or from that to the end, of July, these caterpillars spin together the little stems of the bed-straw, close to the ground, and, forming the slightest covering, they change to brown and shining pupæ. I am indebted to Mr. Moncreaff for a bountiful supply of these larvæ.—
Edward Newman.

Description of the Larva of Pelurga comitata. It generally rests in a straight position, except that the posterior extremity is raised and the anal claspers are not attached to the food-plant, but sometimes the ventral and anal claspers are both firmly attached, the legs and anterior segments held clear of the food-plant, and the back arched; when annoyed it falls to the ground and lies quite motionless, bent nearly double, and bent again at the ventral claspers, the following segment standing out at an obtuse angle with the loop. The head is narrower than the 2nd segment, the anterior margin of which forms a kind of cup, receiving the head; the face is very flat, and the crown without any conspicuous notch: the body is stout and has a dilated skinfold, which is deeply indented at the incisions of the segments, giving the sides of the larva, when viewed from above, a serrated or notched outline. The colour of the face is dark smoky brown, almost black, but the sides of the head and the region about the mouth is paler; the entire head is rather glabrous: the colour of the body is dull opaque olive-brown, with slender rivulet smoke-coloured dorsal stripes, very indistinct except on the anterior segments; on the 5th, 6th and 7th segments is a

dorsal longitudinal series of three yellow dots on each side, and between each series, on the posterior margin of the segment, a transverse median yellow spot; an oblique shade passes forwards from each side of each segment, outside the median yellow spot and inside the three yellow dots; the combination of each pair of these oblique shades forms a V-shaped ornamentation: there are four minute white warts, arranged in a quadrangle, on the back of each segment after the 4th, and each wart emits a small black bristle; the dilated skinfold is of a pale but not vivid pink: the ventral is paler than the dorsal area of the larva, and there is a narrow median ventral stripe still paler, but intersected by a slender smoke-coloured line; this only extends from the third pair of legs to the ventral claspers: there are many minute blackish warts on the ventral surface, each emitting a bristle: the legs are very pale, the claspers concolorous with the body. It feeds on the various species of *Chenopodium* (goose-foot), and is full-fed early in September, when it changes to a pupa on the surface of the earth, and remains in that state throughout the winter, the moth appearing in the June and July following. I am indebted to Mr. Wellman for a most liberal supply of this larva.—*Edward Newman.*

Description of the Larva of Lithostege griseata.—To Mr. T. Brown, of Cambridge, I am indebted for a liberal supply of the eggs and caterpillars of this species, as well as for the food-plants, without which I could not have reared them. Mr. Brown having found the caterpillars in their locality feeding on the seed-pods of *Sisymbrium Sophia*, last year kindly sent me seeds (as he believed) of this mustard, in order that I might be prepared for the coming season of 1867; it has turned out, however, that the seeds so sent were those of *Erysimum cheiranthoides*, but fortunately the mistake did no harm; the caterpillars hatched here from the *Erysimum* at once, and thrived on it well; whilst those captured at large on *Sisymbrium Sophia*, when sent to me, did not make much difficulty about taking to their *substitute* food, and lost no time in completing their full growth on it. I received eggs on June 18th and 19th; the caterpillars appeared soon afterwards, and took about a month to feed up; all being in chrysalis by August 1st. Two days after this date Mr. Brown sent me some more caterpillars, just captured

by himself, and these continued to feed for nearly a fortnight longer. The caterpillar when full-grown is nearly an inch long, rather slender, of uniform bulk throughout, rather flattened beneath; head rather large and rounded. There are several varieties in colour and markings, but as all the captured specimens sent to me by Mr. Brown were of one variety, I have, at Mr. Buckler's suggestion, taken this as

Var. 1.—Ground colour a dull olive-green, except the spiracular region, which is pale yellow; a thin dorsal line of a darker tint of the ground colour; sometimes there is a similar line on either side of it, and sometimes these lines appear only as two olive-brown or purplish wedges just before each segmental fold; subdorsal line greenish gray, with darker edgings; the spiracles are black, and above and just behind them, in the yellow spiracular stripe, are suffused blotches of the colour of the dorsal wedges.

Var. 2.—Ground colour of a fresher, more yellowish green, with the dorsal region of a full green; spiracular region yellowish, and the blotches in it of darker purplish tint than in No. 1, and more clearly defined in shape.

Var. 3.—Ground colour greenish white; three very fine purplish brown or blackish lines down the back, of which the central one becomes wider and darker just *before* each segmental fold, and the other two *across* the fold; sometimes these lines are interrupted, and appear only in the thickened parts; sometimes, again, there is a transverse band uniting the base of all three of these dashes; the subdorsal line paler than the ground, but edged below with the dark colour; the spiracular region of the ground colour, with the wedge-shaped blotches not only above the spiracles as in the other varieties, but also with similar ones below again, and in some specimens the spiracular stripe itself interrupted by these pairs of upper and under blotches being partially united. The anal flap and the anal pair of legs dark blackish green or purplish brown.

Varieties 2 and 3 were reared from the egg on *Erysimum cheiranthoides*. The larvæ went underground to undergo their final change.—(Rev.) John Hellins; *Exeter*.

Description of the Larva of Noctua plecta.—The eggs were laid in a chip-box and were hatched in June, and the larvæ, which fed on *Galium verum* (lady's bedstraw) and

Asperula odorata (sweet woodruff), were full-fed on the 26th of July. The larva rolls itself in a compact ring when annoyed. The head is glabrous, very shining, narrower than the 2nd segment, and especially narrower than the rest of the body, porrected in crawling, and not notched on the crown; the body is smooth and velvety, gradually but slightly increasing in length from the 2nd to the 11th segment, which is broadest; the 12th is rather abruptly truncate. Colour of the head umber-brown, a pale longitudinal patch on each cheek: dorsal surface of body umber-brown; medio-dorsal stripe rather darker, narrow, intersected by a slender interrupted white line; there is an upper-lateral stripe, darker, half-way between the medio-dorsal and the spiracles; this is also intersected by a slender interrupted whitish line; the lower margin of the dorsal surface darker; ventral paler than the dorsal area, particularly at the junction of the two areas, where it may be called a pale lateral stripe; all parts of the body reticulated and dotted with dark brown; feet and claspers of the same dingy colour as the body. I am indebted to Mr. Moncreaff for a liberal supply of this larva.

—*Edward Newman.*

Description of the Larva of Agrophila sulphuralis.—I have to thank Mr. Brown for the opportunity of observing the larva of this local species, but I have little to add to Hübner's description of it. Unfortunately only one egg reached me uninjured, and the solitary larva died when it seemed just about to change; it was hatched June 25th, and died August 15th. The food which I gave it, and which it seemed to eat readily, was *Convolvulus arvensis*, and for the first half of its life two small shoots, bearing five or six little leaves, sufficed it both for food and resting-place. When first hatched it was of a dingy gray colour, with four black transverse humps on as many of the middle segments; but at each moult these humps became less prominent, till they disappeared. When full-grown the larva is about an inch long, cylindrical, the segmental divisions deeply indented; legs twelve; the body is thickest at the 4th segment, and when at rest is usually bent in a curve from the middle. The colour a rich chocolate-brown; the dorsal line rather darker, but edged with very fine paler lines; subdorsal line also darker, but very faintly marked; spiracular stripe broad, of

a pale yellow, with a fine brown thread running through it; after the last moult there are some deep yellow and orange spots in it also, but these soon disappear, as do the usual dorsal dots, which at first are black and plainly visible.—(Rev.) John Hellins; Exeter.

Description of a Caterpillar, brought me by Mr. H. J. Harding, feeding on Hyoscyamus niger, on October 10th, 1867.—Rests in a perfectly straight position on the leaves, especially selecting the ribs, of *Hyoscyamus niger*: it eats both the leaves and ribs, and some of the smaller larvæ had buried themselves in excavations they had made in the latter; it rolls itself in a lax ring when annoyed. The head is narrower and smaller than the 2nd segment, in which it is partially concealed; the segmental divisions are strongly marked, and each has four dorsal and four lateral warts, each wart emitting a rather long bristle, so that each segment has twelve of these bristles, which being white are rather conspicuous; there are other smaller bristles on the belly; with these exceptions the body is uniformly cylindrical; there are ten claspers, fully and uniformly developed; the colour of the head and body is pale dull green, irrorated with white dots, and having three darker dorsal stripes not very distinctly pronounced; after the last change a tawny patch occupies the dorsal area of each segment, near the extreme margin of which are situated the spiracles, which are white, surrounded by a slender black ring, and this again by a whitish ring: the legs and claspers are nearly concolorous with the body, but more transparent. My friend Henry Doubleday believes this to be the larva of *Heliothis peltigera*: it very closely corresponds with a description, published in America, of the army worm (*Heliothis armigera*), so destructive to the cotton crop.—Edward Newman.

Entomological Notes and Captures.

Tube-making Larvæ.—I shall feel greatly obliged if you will give me any information respecting some larvæ I have found. My attention was first directed to them, a few days ago, by my sister, who brought me some blades of grass presenting a very curious appearance, each blade being formed

into a perfect tube. On opening one of these I found it inhabited by a larva; further examination of the tubes showed that some contained three larvæ each. Their general colour is a bright straw, with two brown stripes down the back; body cylindrical, slightly hairy. I have collected about two dozen, and shall be happy to forward you any further account of them. I have enclosed some of the tubes for your inspection. The larvæ are night-eaters, hiding in the tubes during the day.—*C. J. Watkins; King's Mills, Painswick, Gloucestershire, October 7, 1867.*

[I can offer no opinion worth having without seeing the larvæ; they may possibly be those of *Noctua xanthographa*, or perhaps those of a *Leucania*.—*E. Newman.*]

The Genera of Hübner's 'Verzeichniss.'—I see, from a note in the October 'Entomologist' (Entom. iii. 352), that Mr. Doubleday regards Hübner's genera as worthless; first, because they are vaguely characterized; and secondly, because the species which Hübner associated together now prove not to be congeneric. If Mr. Doubleday had merely said that the descriptions were worthless, I could have entirely agreed with him, but I could go no further; for, since badly characterized genera and ill-assorted species are daily to be met with, my opinion is, and always has been, that it is best to consider the type-species as the representative of each genus (of course there is no harm in amplifying the description of its structural details as much as we please), and, should it prove to be congeneric with the type of any group previously characterized, reject it; but if we are bound to sink a genus because all the species included therein are not nearly allied, or because its characters do not seem sufficiently clearly defined, there will still remain much to be done ere all will be settled to our fancy and that of all brother Entomologists. Secondly, why should there be so much difficulty about receiving some of Hübner's genera, whilst others are adopted without a murmur? and how is it that the genera of more recent Entomologists are sometimes permitted to stand, even without any description whatever, and simply because the typical species is known and its generic distinctiveness at once apparent? Thirdly, is not a generic name altogether a convenience, and simply intended to associate closely-allied species; if so, why not be satisfied with the first name given,

examine the structure of the type, and, associating with it all generic forms, save the useless multiplication of synonymses.—*Arthur G. Butler*; October 1, 1867.

[This subject may safely be left here: further discussion will not tend to elucidate it; and entomological writers will continue to do exactly as they please, whatever course may be recommended to them. Thirty years have elapsed since I printed my opinion, in Loudon's Magazine of Natural History, that genera were purely artificial associations, and that it is quite immaterial with what *generic* name a specific name is associated. It is a matter of courtesy only, perhaps of convenience, that we should all use the same, but I would frankly admit the right of Mr. Butler or anyone else to employ the generic name in which he found most comfort and satisfaction to himself.—*Edward Newman*.]

Second Brood of Pyrameis Cardui.—The larvæ of *Pyrameis Cardui* have appeared in this neighbourhood for the second time this season. I have enclosed a few of the larvæ in a box, thinking you may be interested in the appearance of a second brood. Between the 26th of July and the 16th of September I could not find a single larva. On the 16th of September I took four dozen very small larvæ, and on the 24th about three dozen, some of them full-fed.—*W. West*; 6, Green Lane, Greenwich, September 26, 1867.

Acherontia Atropos at Halifax.—I had a very fine specimen of *Acherontia Atropos* brought to me on Saturday, the 5th of October: it was found in All Soul's churchyard, by Mrs. Holmes, and was laying on the grass as if quite benumbed with the cold (the preceding night had been very frosty). I am not aware that there any potatoes growing near where the moth was found, and it is the first instance that I know of one being taken near here.—*D. Baxendale*; Akroydon, Halifax, October 9, 1867.

Chærocampa Celerio at Taunton.—On the 17th of September I had brought me, by a boy, a specimen of the above-named insect, which he had captured in a workshop in the town, flying about the lights. It was very much damaged. It is a rather singular circumstance that about two years ago the same boy brought me a specimen of the same insect, and which was recorded in the 'Entomologist' at the time.—*Wm. Bidgood*; Museum, Taunton.

Varieties of Larva of Smerinthus Populi.—Enclosed with this note I have sent you a variety of *Smerinthus Populi*, several of which I have found this year. The following are the particulars:—Aug. 21st. I found about a dozen larvæ of *S. Populi*, amongst which was one with the ground colour very much paler than the rest, and having a row of pink blotches along the side by the spiracles, and another row above along the back. Sept. 16th. I found a full-grown one, the ground colour very pale glaucous, with pink blotches just the same as the previous one, with the exception that they became smaller as they approached the head (the first one described having all the spots the same size). Sept. 17th. I found two of a pale whitish green, with blotches along the spiracles, no spots at all along the back; also two more full-grown ones, with ground colour much darker than any before found, pink blotches along the spiracles and two pink blotches just behind the head, two about the middle of back and two at base of horn: I have not met with these varieties before; I do not know whether they are of frequent occurrence: I have kept the first two separate from the ordinary kind, in order to see if there will be any difference in the perfect insect. They were all found in the same garden, on a row of poplar trees. I may also state that I found, about the same time last year, two larvæ of *Dicranura furcula*, one of which I successfully reared.—*S. J. Barnes; The Poplars, Trafalgar Road, Moseley, Birmingham, October 1, 1867.*

Chærocampa Nerii at Sheffield.—On the 14th of September the above rare insect paid a visit to a neighbour of my friend Mr. W. Sheldon. I should think it would be the light that attracted it, for at the time it entered there was a large paraffin oil lamp glaring, and after a flight or two round the house it alighted on the table, and sat quite composed; but not so with the inmates, for they started from their seats and gazed on the intruder with astonishment; but the worthy host, having a little more courage than the rest, took up a large cloth and flung it over the moth and secured it; and knowing my friend Mr. Sheldon was an Entomologist they ran with it to him as fast as their legs would carry them, and told him they had brought him a large moth; so my friend gave the moth a nice dose of chloroform, and the old gentleman was soon so fast asleep that it was not much

trouble to operate on him with a large-sized pin. The body and thorax are a little rubbed, and no wonder when we consider the mode of capture. I have the insect in my care at present.—*Wm. Hydes ; Bagshaw's Buildings, Park Spring, Sheffield, October, 1867.*

Geographical Range of Nyssia zonaria.—This moth, which on account of the apterous condition of the female has long been considered one of the most interesting species inhabiting the Wallasey sand-hills, appears to have a somewhat extended range along the coast. Some years ago it swarmed at Wallasey, and then became scarce; it is now, however, pretty abundant there. It has, I believe, been found in the neighbourhood of Hoylake. Crossing the Dee, I have taken the larvæ near the Point of Air. Between these two places, however, it occurs in a very singular locality. My friend Mr. Brockholes informs me that he has found the species in plenty on the salt-marsh up the Dee, in the neighbourhood of Puddington, at a spot occasionally overflowed by the tide. When the water floods their habitat the insects are to be seen creeping up palings, &c., out of reach. Proceeding along the coast from the Point of Air, I have once found the larvæ near Prestatyn, and have taken them freely on the sand-hills close to Rhyl. This summer, while entomologising on the small sandy plain on the left bank of the river Conway, where it reaches the sea, I found the full-fed larvæ in abundance. Along the coast to the north of Liverpool the range of the species appears to be more limited. For several years none but the winged males were found on the Crosby sand-hills, and these were supposed to have flown across from New Brighton. Several attempts were made to stock the sand-hills with larvæ brought from the other side of the river. Whether from this or from natural causes, I understand that the species is now somewhat plentiful in that locality.—*F. Archer, jun., in 'Liverpool Naturalists' Journal' for August.*

The Silkworm in China.—Mr. Rutherford Alcock has forwarded the translation of a curious document on this subject, issued by the Chinese officials in Fuhkien. It provides that the waste lands shall be planted with mulberry trees, and that "persons can, if they please, combine the occupation of mulberry-growers and silkworm-rearers, or grow mulberries

alone; those rearing silkworms will obtain the produce of their labour, and those growing mulberries in the same way the produce of theirs. The Book of Rites saith, 'The man who planted 1000 acres in the kingdoms of Chi and Lu with mulberries became lord of 1000 farms,' &c. Why, then, do you fear you will not succeed? The area of Government land on which mulberries can be grown being limited, trees cannot be given to all; people will therefore be expected to plant at the corners of walls, between the furrows, at the roadsides, and every other available nook and corner. No ground will be permitted to be wasted. Apparatus for rearing silkworms can be obtained from the committee, according to the number of growers, and can be used by the silkworm proprietors on their finding some respectable person to be security for them; they will be required to return the same to the committee uninjured within ten days after they have finished with them. The proprietors who procure cocoons, and understand unwinding the silk, can apply to the committee for winding machines (or combs), which must, however, when done with, be returned. The silk can either be sold by the proprietors themselves or be handed over to the committee, who will pay them the market price for it. Those unable to unwind the silk can dispose of their cocoons to the committee, at the marketable value, for ready money; no bartering, by which the proprietors might suffer loss, will be tolerated."

Does the Female of Sterrha sacraria possess the Costal Stripe?—In answer to the inquiry of Mr. Pristo (Entom. iii. 348), whether the female of *S. sacraria* possesses the costal stripe, the one whose capture I recorded at page 347 has the costa reddish brown from the base about one-third of its length. The discoidal cell also contains a pink dash, occupying about half its length from the veinlets; there is also a brown dot near the point where the subcostal vein joins or leaves the cell. The transverse band in this specimen is crimson at the inner edge, deepening to brown on the outer or marginal side.—*G. Gascoyne; Newark, October, 1867.*

Sterrha sacraria in Dorsetshire.—My son Edward took a male specimen here on Saturday last.—*J. C. Dale; Glanvilles-Wooton, Dorset, September 3, 1867.—Ent. Mo. Mag.*

Sterrha sacraria at Greatham, Hampshire.—In a list of

moths sent by Captain Chawner and Mr. Benn, these gentlemen mention the capture of one specimen of *Sterrhia sacraria* near Greatham, in 1867, but no more particular date is given.

Sterrhia sacraria in the North of Perthshire.—At about two o'clock in the afternoon of the 14th of August, after walking over an unproductive tract of country in the North of Perthshire, during my stay at Rannoch, I was reflecting rather ruefully on the few Tortrices in my pocket, sole result of four hours' labour, when a small moth, flitting gently from a patch of grass, settled almost at my feet. I knelt down to examine the crevice into which the new comer had retreated, and there—most lovely and welcome sight—was *Sterrhia sacraria*! Nothing but the biggest pill-box I had about me could be worthy of so illustrious a visitor, and, having sumptuously installed him therein, I postponed my lunch *sine die*, and set to work to find another. Whether the sight of an Entomologist on his knees had proved propitiatory I cannot say, but a few steps further on a second specimen stole gently from his retirement, and went to keep the first company. In about an hour I found a third, and with these (all males) I trudged home well pleased. Many profitless hours I spent afterwards at the same spot, in hopes of obtaining the other sex.—*J. B. Blackburn ; Grassmeade, Wandsworth, September, 1867.—Ent. Mo. Mag.*

Cerura vinula cannibalistic.—I have been breeding *Cerura vinula* this year, and was rather annoyed to observe the cannibalistic proclivities manifested by some of the stronger members of the brood, in their determined attempts on the "tails" of their weaker brethren. Several died, but others survived the amputation, probably the surgical aptness of the operators being of various grades. Can you inform me whether larvæ mutilated in the manner referred to produce perfect imagos?—*H. McDowell ; Kettering, October 6, 1867.*

Dianthæcia Barrettii.—In No. 46 of the 'Entomologist' (Entom. iii. 349) Mr. Newman expresses an opinion that this insect is only a melanic form of *D. conspersa*. On comparing our series of the two species I am unable to perceive more than a vague resemblance of markings between the two insects. The shape and position of the pale markings do not correspond, nor are all these represented in both species. *D. Barrettii* has really more resemblance to *D. capsophila*.

The Rev. H. H. Crewe and myself have collected a number of larvæ, supposed to be those of *D. capsophila*, in the locality where *D. Barrettii* also occurs, and I am not without hopes that there may be both species among them. I have heard doubts expressed by more than one Entomologist of note as to whether *D. Barrettii* is a true *Dianthæcia* at all, but should *D. Barrettii* and *D. capsophila* be reared from the same larvæ this will dispose of the question of genus and species together. — *W. F. Kirby; Dublin, October 16, 1867.*

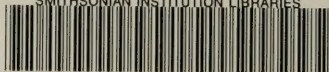
Life-history of Hydrocampa nymphæalis. — Having found the larva of *Hydrocampa nymphæalis* feeding on the common star-wort (*Callitriche verna*) on the 8th of June, I thought a few notes on its habits would be interesting to some of your readers. I found it very common in all the muddy pools in Epping Forest, where its food-plant was growing. When very young it forms itself a case with a piece of rush, and fastens itself to the plant on which it feeds with fine threads. I took some of the larvæ home, and put them into a glass vessel, so that I could watch their changes. It lives entirely under water, and as it grows larger it cuts itself a case out of the leaves and joins them together, and floats about in it like a boat; it puts its head out of its case, and with its fore legs draws itself from leaf to leaf. The larva is dirty yellow, the head black; on each side of the 2nd, 3rd, 4th, 5th and 6th segments there are four air-cells, which look like small glass balls. They assumed the pupa state in their cases, and appeared in the perfect state on the 10th of July. — *Thos. Eadle; 7, Maidstone Place, Goldsmith Row, Hackney Road, October, 1867.*

Occurrence of a Fumea (F. crassiorella, Bruand) new to Britain. — I have bred several specimens of a *Fumea* this year which proves to be *F. crassiorella, Bruand.* The males are larger than either *F. nitidella* or *roboricolella*, to which group they belong. The female is also larger and more obese. I have had males in my cabinet for some time, but it was only this year, by breeding the female, that I was enabled to make out the species; there are good figures in Bruand's 'Monograph,' fig. 68, *a* male, *b* female, plate 2. — *Fredk. Bond; 21, Adelaide Road, Haverstock Hill, N.W., September 11, 1867. — Ent. Mo. Mag.*





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